

Table of Contents

Executive Summary	Page 3
Reconstruction Committee Members	Page 5
Overview of Incident	Page 6
911 Calls and Dispatch of Units	Page 9
Arrival of Units and Conditions Found	Page 10
In Their Own Words	Page 12
Contributing Factors	Page 16
The Structure	Page 21
Radio Transmissions and Presumed Activities	Page 22
Incident Time Line by Communications	Page 27
Investigation into the Cause and Origin	Page 30
Investigation Time Line	Page 31
Protective Clothing Summary	Page 32
Findings and Recommendations	Page 33
Conclusion	Page 41

Appendices

Appendix A- BCFD, Fire Investigation Report

**Appendix B- Findings of the United States Department of Justice – Bureau
Of Alcohol, Tobacco, Firearms and Explosives (ATF)**

Appendix C- Reports from BCFD Safety Office

Appendix D- NIOSH Evaluation of SCBA

Appendix E- BCFD Evaluation of SCBA

Appendix F- Manufacturers (Lion Apparel) Protective Clothing Report

Appendix G- BCFD Protective Clothing Report & Photographs

Appendix H- MOSH Investigation Report

Appendix I- BCFD - MOP and Operations Memos on RIT (past and present)

Appendix J- BCFD – MOP - Fire Operations and Command

Appendix K- BCFD – MOP – Fireground Operations (Engine – Truck)

Appendix L- BCFD – MOP – Fireground Evacuation Plan

Appendix M- BCFD – MOP – Shift Safety Officer Duties

Appendix N- BCFD – MOP – Personal Protective Clothing and Equipment

Appendix O- BCFD – MOP – Personnel Accountability Report (PAR)

**Appendix P- BCFD – Training Manual – Draeger Breathing Apparatus,
Advancing Hose lines and PBI Hoods**

Appendix Q- NFPA Standards 1500 and 1561

Appendix R- Special Reports from Members Involved

**Appendix S – NIOSH Reports on Fire Fighter Deaths [Washington, D.C. &
California]**

Executive Summary

The Baltimore City Fire Department is a 1600 member department that provides Fire, Rescue, and EMS services to the City of Baltimore. Members staff 36 Engine/Squad Companies, 19 Truck Companies, 6 Battalions, 1 Heavy Rescue, 22 Medic Units, and various specialized units full time. Baltimore City encompasses 92 square miles and is home to 651,000 full time residents. This population swells to 2 million during a normal work day.

On October 10, 2006, Baltimore City Fire Fighter [FF] Allan Roberts, Fire Fighter/Paramedic Apprentice [FPA] Brandon Mattox, and FPA James Butler sustained injuries in the line of duty while battling a two-alarm fire located at 514 South Macon Street in Baltimore City. FPA Mattox and FPA Butler survived their injuries. Sadly however, FF Allan Roberts died as a result of his injuries.

As a result of this incident, Baltimore City Fire Chief William J. Goodwin Jr., appointed a reconstruction committee to investigate, evaluate, and make recommendations on the emergency response and activities conducted during and after this tragic event.

This report is the result of evaluations of evidence collected, eyewitness reports, audio of fire ground communications, video and photographs taken at the scene, reconstruction of the scene, testing theories with members involved in the incident, interviews, independent investigations, and reports of other investigators and agencies.

During the course of this investigation the committee determined that there were a number of deficiencies involved in this incident. These issues fall into the following categories.

Fire Ground Command:

Example:

The incident commander failed to realize a designated RIT was not in place until the need for one arose.

Unit Operations:

Example:

1) The dwelling was not properly ventilated prior to fire fighters entering the building. This contributed to the intense heat and heavy smoke conditions encountered by those members on the interior attack lines.

2) Unit officers of the members on the initial interior attack line did not maintain direct supervision and control of those members.

Fire Ground Tactics:

Example:

At least one hose line was directed on the fire in the rear of the dwelling while members were inside the building. This action contributed to the intense heat experienced by members on the interior attack line.

Safety:

Example:

1. All indications show that FF Roberts was not wearing a protective hood when he entered the dwelling.
2. The Incident Safety Officer arrived on the scene 11 minutes and 50 seconds after BC1 gave his report of "heavy smoke showing," and 4 minutes and 24 seconds after the first report of trapped fire fighters.
3. It took 2 minutes and 16 seconds after BC1's directive for the SO to begin conducting a Personnel Accountability Report [PAR].

Communications:

Example:

The initial verbal dispatch of units was given in an incorrect order by the Fire Communications Dispatcher.

Inspections:

Example:

It was difficult to identify an individual's turn-out gear because gear was either improperly marked or not marked at all.

The committee has recommended solutions to address each of these identified problems. These recommendations can be found in detail in this report. Most of the proposed solutions involve adhering to established policies and procedures regarding incident command, unit operations, personal protective equipment, communications, and fire fighter safety. The effectiveness of these policies and procedures depends upon each individual's desire to make his or her safety, and the safety of others, their paramount concern when operating at emergency incidents.

Reconstruction Committee

Fire Chief Mr. William J. Goodwin Jr appointed the following individuals to the Baltimore City Fire Department's Reconstruction Committee.

Chairman:

Deputy Chief of Administration, Mr. Theodore Saunders, Baltimore City Fire Department

Members:

Deputy Chief of Operations, Mr. Gregory Ward, Baltimore City Fire Department

Division Chief Arthur Cate III, Baltimore City Fire Department

Chief Safety Officer, William Jones, Baltimore City Fire Department

Battalion Chief Michael Campbell, Baltimore City Fire Department and 2nd Vice President of Fire Officers Local 964

Battalion Chief Carl M. Bull, Baltimore City Fire Department

Pump Operator Robert Sledgeski, Baltimore City Fire Department and Secretary Treasurer of Fire Fighters Local 734

Special Agent (Certified Fire Investigator) Gregg Hine, United States Department of Justice, Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF)

Special Agent Matthew Varisco, United States Department of Justice, Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF)

Overview

On Tuesday October 10, 2006 at 02:21.36 hours, the Baltimore City Fire Communications Center received the first of multiple calls reporting a fire at 514 South Macon Street (the first call mistakenly reported the address to be 512). Several of these calls reported that people were trapped in the building. At 02:22 hours Box 11-7 was dispatched to the scene. The initial response included four engines, one squad, two trucks, two battalion chiefs, and one medic unit. The order of dispatch was: Engines 41, 5, 50, 51, Squad 11, Trucks 20 & 3, Battalion Chief 1 [Incident Command], Battalion Chief 2, and Medic 20.

At 02:24.48 hours, Battalion Chief 1, Mr. Reese Wingate, arrived on the scene, placed himself in command and reported a two-story dwelling with heavy smoke showing from the 1st and 2nd floors. In addition to the standard reports from arriving units [location of hydrants, etc.], at 02:26.07 hours, Truck 20 requested a medic unit for a civilian who had jumped from the second floor window.

After establishing a water supply [leading off] at the corner of Eastern Avenue & Macon Street, Squad 11 proceeded south on Macon and was positioned approximately 75 feet from the front of 514 S. Macon St. Members of Squad 11 including, Acting Lieutenant Andre Darden and Firefighter/Paramedic Apprentice James Butler [who recently graduated from the Training Academy about one month prior to the fire], and members of Engine 41 including Lieutenant Michael Hollingshead, Firefighter Allan Roberts, and Firefighter/Paramedic Apprentice Brandon Mattox [also a recent graduate of the Training Academy], began to advance hose lines to the front of the dwelling. This initial attack line was manned by FF Roberts on the pipe [nozzle], FPA Mattox directly behind him and FPA Butler third on the line. It is believed their intent was to take the line directly to the second floor to search for the occupants who were reported trapped.

As they entered the dwelling, they encountered heavy smoke and moderate heat conditions. Crawling on their hands and knees they advanced the line up the stairs toward the second floor to search for the occupants who were reported trapped [See drawing following page 8]. At various times Lt. Hollingshead, acting Lt. Darden and FFPM Nancy Goeb [SQ. 11] also entered the dwelling and were positioned in the hallway near the front door. At the top of the stairs FF Roberts reported to FPA Mattox that he did not see any fire. Both Maddox and Butler reported during their interviews that they heard a report [either on the radio or from someone in the building] that there was fire in the basement. As a result they decided to evacuate the dwelling and began their retreat. Within seconds the heat intensified. Almost simultaneously, Lt. Hollingshead yelled to members in the dwelling *"lets get out of here it's getting too hot"*. Immediately after giving that order, Lt. Hollingshead made radio contact with command at 02:31:57 hours and reported that *"we need it opened up, it's getting real hot"*, after which he exited the building. As they began to back down the stairs, FPA Mattox and FPA Butler heard FF

Roberts scream in pain. FF Roberts then ran past FPA Mattox on the stairs. It is at this point that Maddox began to receive burns to his left arm.

Once in the hallway, FF Roberts ran into FPA Butler in the narrow hallway near the front door. They both fell to the floor and against the front door, forcing it almost entirely closed (leaving only enough space for a charged 1 3/4" hose line to pass through. FPA Mattox, in full retreat because of the intense heat, fell on top of FF Roberts and FPA Butler. After falling to the floor, FF Roberts was motionless and unconscious, lying in a prone position.

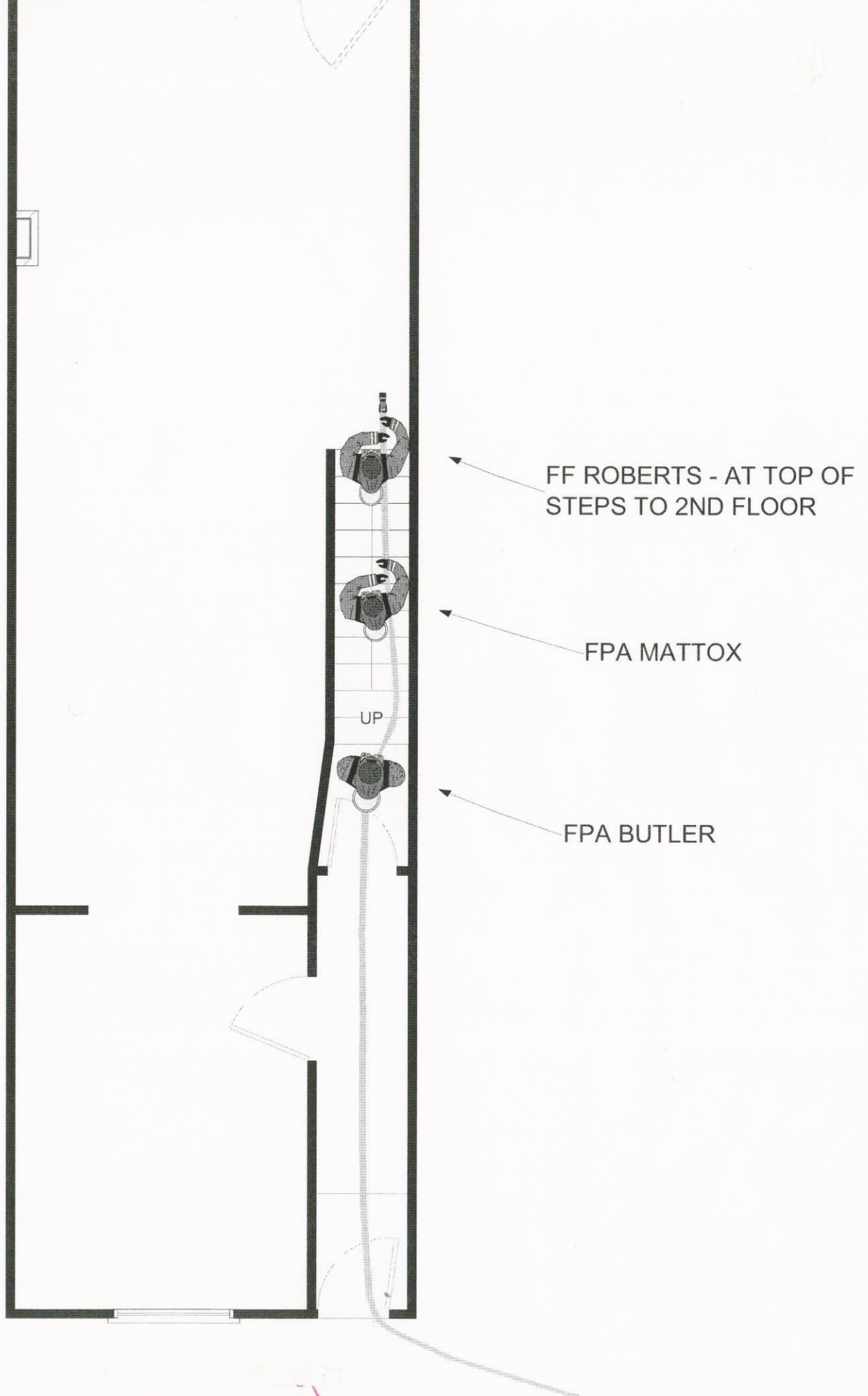
Within seconds of the door slamming shut as a result of FPA Butler and FF Roberts falling against it [see drawing following page 8], BC 1, who was standing directly in front of the dwelling reported at 02:32.04 hours that he had a man trapped and asked for the location of the Rapid Intervention Team [RIT]. Firefighters working in front of the dwelling and the entry team that had just exited the dwelling immediately began attempts to rescue the three trapped members. Rescuers were able to force the door open just enough to pull FPA Butler and FPA Mattox from the building. With FPA Butler and FPA Mattox rescued, FF Roberts' motionless body blocked the swing of the door in such a way that it became impossible to remove him in the same manner. As a result, rescuers were forced to remove the door entirely from its hinges in order to remove FF Roberts.

The initial assessment of FF Roberts' condition found him with severe burns to the face, airway, and hands, and in full cardiac arrest. Advanced life support care and resuscitation efforts were initiated immediately. FF Roberts was then transported to Johns Hopkins Bayview Medical Center, which is less than two miles from the scene. Efforts by the hospital staff were unsuccessful and FF Roberts was pronounced dead at 03:14 hours.

Operations in the Rear of the Dwelling

In addition to the fire ground operations that were taking place in the front of the dwelling, operations were almost simultaneously being carried out in the rear. Engine Company 51 secured a water supply and advanced a 2 1/2" attack line to the rear of the dwelling via the side and rear alleys establishing a water supply to side C [rear]. The officer and members of Truck Company # 3 arrived in the rear with tools and ground ladders and as the crew laddered the exposed dwelling the Officer, Captain Jeffery Jakelski, at 02:28.47 hours requested a report from command on the accountability of the occupants of the involved dwelling. Command replied that he was unable to ascertain at that time. Truck 3 followed with a size up on conditions on the C side and requested command to call for BGE [Baltimore Gas and Electric] due to arcing wires at 02:29.06 hours. At 02:29:31 hours Captain Jakelski reported that the fire was extending into the second floor exposures, side D and B. Battalion Chief 1 [Incident Commander] advised on the air at 02:29:48 hours *"We have two occupants out of the building. They are reporting no one else inside at this time."*

As Engine 51 was attempting to put a hand line in service approaching from the north end of the alley, Engine 5 was stretching a 1 ¾ " attack line through the alley from the south end. Engine 5 charged their line while Engine 51 was adding additional hose to their line. The pipe man on Engine 5 took a position in the alley just outside of the rear yard of the fire building. The Captain of Truck 3 was now with the pipe man of Engine Company 5. The Captain of Truck 3 contacted command in an attempt to ascertain if an interior attack was being attempted from the front. He also informed command that they were in a good position to attack the fire from the rear at 02:30.10 hours. Command advised units in the rear that he had companies advancing in the front and instructed the units in the rear to check out the exposures only and not to push the fire in on members advancing in the front. The officer of Truck 3 informed command that they would not go in and that there was fire in the basement. Command asked if they had access to the basement and Truck 3 acknowledged at 02:30:44 hours that they had access to the basement and the first floor. At 02:30:55 hours Command ordered Truck Company 3 to take a line to the basement. The pipe man on Engine 5, assisted by Truck 3, opened the pipe and directed the stream into the basement while advancing the line into the back yard. At 02:31.32 hours the Captain of Truck 3 updated command by reporting that they could not get into the basement due to downed wires. The attack line was still flowing water into the basement from the rear yard at that time. At 02:31:57 hours the officer of Engine 41, who entered from the front, transmitted a message that "we need it opened up, it's getting real hot". Seven seconds later at 02:32:04 Command requested a Rapid Intervention Team due to a trapped man in the front.



514 S. MACON STREET - FIRST FLOOR



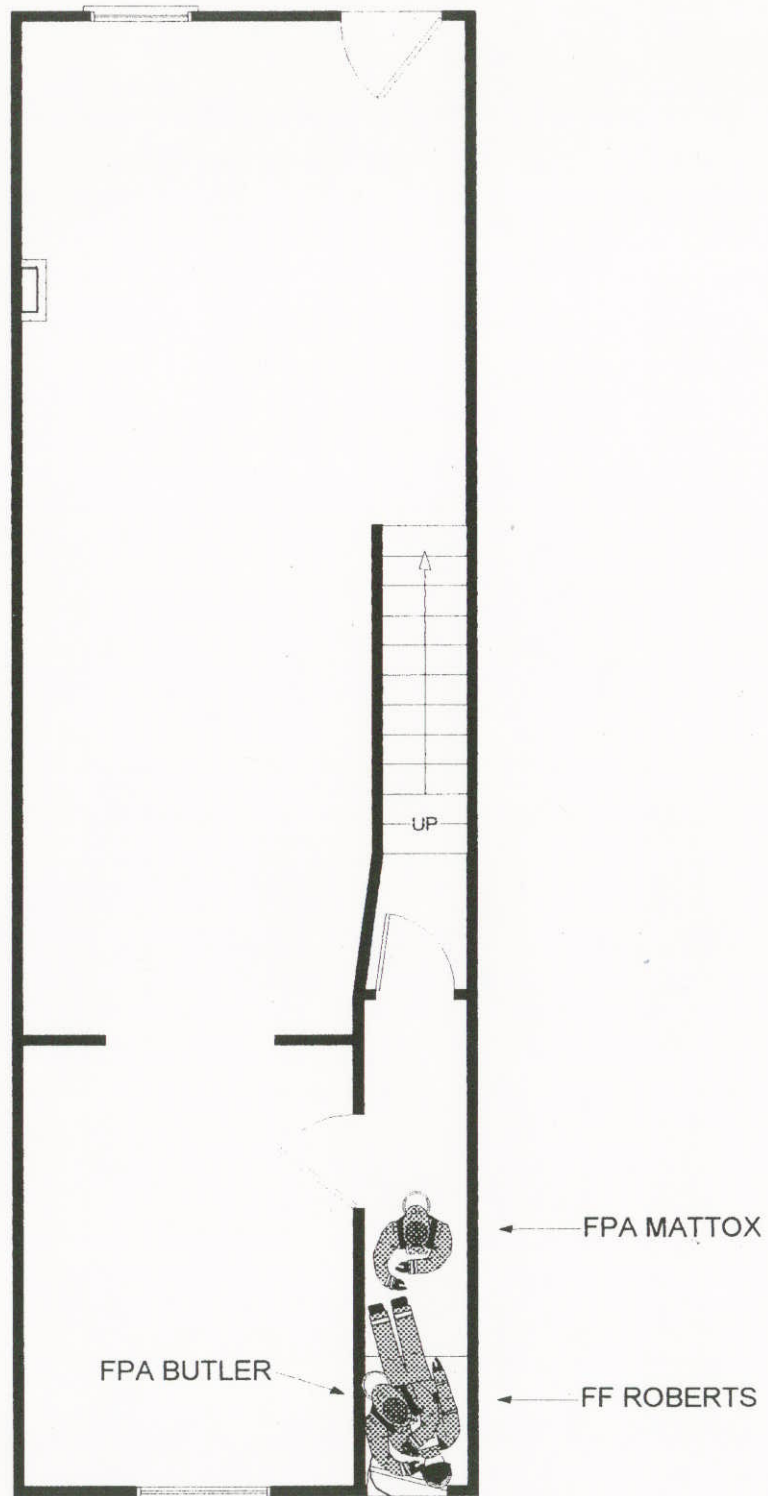
Re-enactment photo showing first hose line being advanced into the dwelling.



Re-enactment photo showing members beginning to advance hose line to the 2nd floor.



**Re-enactment photo showing the final position of members on the stairs.
This is as far as the members were able to advance.**



514 S. MACON STREET - FIRST FLOOR



Re-enactment photo showing position of members after falling to the floor near the front door.



**Re-enactment photo showing FPA Butler
being pulled out of the dwelling by rescuers.**



**Re-enactment photo showing FPA Mattox near the door
after the rescue of FPA Butler.**



**Re-enactment photo showing FPA Mattox
being rescued from the dwelling**



Re-enactment showing FF Roberts' position that prevented rescuers from opening the door. The door had to be removed in order to remove him from the dwelling.

The 911 Calls and Dispatch of Units

On Tuesday October 10, 2006 at 02:21.36 hours, the Baltimore City Fire Department's Communications Center received the first 911 call reporting a fire at 512 South Macon Street [the correct address was later found to be 514]. The female caller reported that her neighbor's house was on fire and that there was someone trapped in the building. Following this initial report there were a total of 7 additional calls reporting the same fire.

As a result of these calls, Box 11-7 was dispatched to 512 S. Macon St. at 02:22 hours. The order in which units were dispatched was as follows:

Engine 41, Engine 5, Engine 50, Engine 51, Squad 11, Truck 20, Truck 3, Battalion Chief 1, Battalion Chief 2, and Medic 20.

However, according to the Computer Aided Dispatch [CAD] System these units were dispatched in the wrong order. The proper order of dispatch should have been as follows:

Squad 11, Engine 41, Engine 50, Engine 51, Engine 5, Truck 20, Truck 3, Battalion Chief 1, Battalion Chief 2 [Note: Medic units are dispatched according to availability at time of dispatch].

The improper order of dispatch contributed to some confusion that developed later regarding which unit should have been the initial Rapid Intervention Team [RIT]. Both the Incident Commander and the Fire Ground Dispatcher were not applying the RIT policy that was in effect at the time of the incident.

Arrival of Units and Conditions Found

Battalion Chief 1 [BC 1] was the first to arrive on the scene at 02:24.48 hours. He drove past the front of the dwelling [514 South Macon St.] and gave the following initial report: *"I got a two story middle of group, heavy smoke showing, I'll be command."*

BC 1 subsequently parked his vehicle at the northeast corner of Fleet and Macon Sts. He then made a quick pass of the alley and observed heavy fire conditions in the rear and immediately upgraded the incident to a working fire at 02:25.28 hours.

Squad 11 was the first engine on the scene. Members stated that upon their arrival at 02:25.14 hours they observed heavy black smoke coming from the second floor front window and front door. Squad 11 stopped at the corner of Eastern Ave. and S. Macon St to allow Truck 20 to go past to cover the front of the dwelling. Squad 11 then led off with a 3" line from the hydrant located at the southeast corner of that same intersection. During this process, Squad 11 dropped 5 sections of 3" hose and positioned their engine several dwellings north of the fire building.

Engine 41 [which was erroneously dispatched 1st] arrived as the second engine. Engine 41 stopped at Eastern Ave. and S. Macon St. to cover Squad 11's hydrant at 02:25.36 hours. As Squad 11 proceeded down Macon St. towards the dwelling, FF Roberts and FPA Mattox, now on foot, ran along side of Squad 11. At this time it is noted that FF Roberts has his face piece on but it is not connected to the second stage regulator. Once Squad 11 spotted their apparatus [see drawing following page 11] FF Roberts removed the "five side" [250' pre-connect of 1-3/4"] hose from Squad 11's cross lay. FF Roberts [E-41] then advanced the hose line to the front of the dwelling, and was followed by FPA Mattox [E-41] and FPA Butler [SQ-11]. FF Roberts then connected his second stage regulator to his face piece and entered the dwelling.

Truck 20 was the first ladder truck on the scene and was positioned in front of the dwelling at 516 South Macon St. Members stated that they found the same conditions of heavy black smoke and no visible fire from the front of the dwelling as previously reported by BC 1. Truck 20 had to reposition the apparatus several times so they could extend the outriggers between the parked cars on this narrow street. This caused a delay in properly ventilating the structure before the hose was advanced into the structure.

Truck 20's driver, EVD Joe Evans, placed the aerial ladder to the roof of the exposure dwelling [side Bravo] at 516 South Macon St. The remaining members of Truck 20 raised a 24 ft. extension ladder to the left front window of the second floor and ventilated it. While in the process of getting the 24ft. ladder off the truck, the officer of Truck 20 reported the following at 02:26.07 hours *"Truck 20 to command, we need a Medic unit for civilian who jumped out of the second floor window"* At 02:26.14 hours Medic 20 reported *"Right behind you"* in response to Truck 20's request. Battalion Chief 1 then asked for a second Medic at 02:26.18 hours.

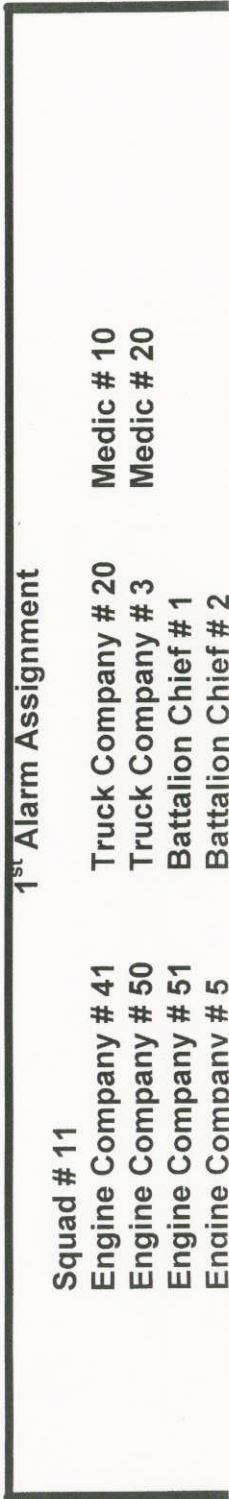
Engine 51 was the first Engine in the rear and led off from the hydrant located at the northeast corner of Eastern Ave. and S. Macon St. at 2:26.46 hours. Engine 51 stretched their 2 1/2" line south, through the rear alley. They then attached a gated wye and two sections of 1-3/4" hose.

Truck 3 arrived in the rear at 02:28:41. At 02:28.47 hours Truck 3 asked: "*Are all of the civilians out of the building?*" Battalion Chief 1 responded "*Unable to ascertain at this time*" Then at 02:29.06 hours Truck 3 stated: "*We got heavy fire in the rear, arcing wires, I need emergency BGE; we're unable to gain access at this time.*" At 02:29:31 hours the officer of Truck 3 reported: "*Alright Chief, the fire is extending into the second floor dwelling on side D and side B*" [exposure buildings on the left and right sides of the fire building].

Engine 5 arrived on the scene at 2:28:41 hours and stretched the first hose line [1-3/4"] to the rear of the dwelling.

Engine 50 was the fifth arriving engine on the scene. Members of Engine 50 reported leading off from a hydrant located at Foster Ave. and S. Macon St. and supplied Engine 5 with water via the 3" line. Members of Engine 50 then pulled a second 1 3/4" line off of Engine 5 and proceeded up the alley to assist in fire extinguishment.

Note: There were a total number of four hose lines in the rear of the dwelling.



In Their Own Words

FPA James Butler, Squad 11

FPA Butler recalled entering the dwelling *"I was the 3rd person to crawl into the dwelling; it was FF Roberts, FPA Mattox and then me. We advanced into the dwelling and began to advance up the stairs when we received a message to evacuate because of a basement fire. I passed the message to Mattox who passed it forward to Roberts. We all began to withdraw when the heat began to rise rapidly. I started backing up, I was maybe 6 feet from the door when someone plowed into me he was big like Roberts, I fell backwards, I heard FPA Mattox say 'it's hot get out.'*

At this point FPA Butler was lying on the floor with his back against the side B wall of the hallway and his right arm in the opening of the door with FF Roberts lying unconscious on top of him. The front door was in the closed position, only opened enough to accommodate a 1-3/4" hose line and FPA Butler's right arm. FPA Butler tried to open the door by grabbing the edge of the door with his left hand and started pulling. With his left hand on the door above his head he could feel severe heat and burning to his left hand. FPA Butler could feel someone pushing the door from the outside and he managed to get the door opened enough to get his head out and he stated *"It felt like 4 sets of hands pulling me out"* Once out of the dwelling FPA Butler fell to the ground and later recalled that *"I looked up and saw FPA Mattox come out the same way I did. I started yelling 'there's still someone in there'. I knew they knew because they were still working on opening the door"*. FPA Butler sustained first and second degree burns to his left hand, left forearm and right forearm.

Note: The door slammed almost entirely shut as a result of FF Roberts running into FPA Butler in his attempt to exit the dwelling. This action took place at 02:32:04 hours, just prior to the time that BC 1 asks on the air, *"Where is my RIT, I got a man trapped in the front"*.

FPA Brandon Mattox, Engine 41

FPA Mattox recalls being directly behind FF Roberts and states *"FF Roberts got to the top of the steps and said 'there's no fire up here'. I then heard - I believe over the radio - 'it's a basement fire' and we started backing down the steps and about 3 seconds later, FF Roberts started yelling and screaming in pain while still on the stairs. FF Roberts then ran past me on the stairs that's when I felt the burning to my whole left arm. I turned and headed to the door. I saw a crack at the bottom of the door and crawled towards it. I then heard FPA Butler say 'something's up against the door, I can't get it open'. I saw him squeeze out and I went right behind him"*. FPA Mattox sustained second-degree burns to his left arm and left hand.

Note: FPA Mattox stated that he felt a sudden increase in temperature while still on the stairs leading to the second floor. He went on to say *"That's when I felt the burning to my whole left arm."*

Lt. Michael Hollingshead, Engine 41

Lt. Hollingshead recalls entering the dwelling *"I had the pipe of the second line and backed up the first line. In front of me was FF Darden, than FPA Butler, than FPA Mattox, and FF Roberts was on the pipe of the 5 side. I got in about 4 or 5 feet than had to back out because FF Darden said he's getting or feels like he's getting burned. That's when I called on the radio and stated 'it's real hot, we need to get the place opened up'. When I got outside I grabbed a potted plant and smashed the front window, I then crawled back into the dwelling. Once back in it still felt hot. I went in about 5 or 6 feet again, I was real hot, I started yelling 'lets get out of here it's too hot'! I crawled out the front door and the door shut right behind me as soon as I got out. I immediately tried to push the door open and it would not move. I yelled 'get off the door, get away from the door, back off'. We got the door opened just enough to grab FPA Butler then FPA Mattox. FF Darden and others were helping me at the door; I knew FF Roberts was still in there. Someone took an axe and hit the hinges of the door. We got the door off of the hinges and then I reached in and pulled FF Roberts out. He was in the corner between the wall and the door on the hinge side. The Medic and other members were attending to FF Roberts and I grabbed a line and crawled back in the dwelling and saw a lot of fire on the ceiling of the first floor and at the top of the steps on the second floor I was hitting it from the hallway. I then came back out I was hot and beat. It was the hottest fire I was in, in 16 years"*.

Note: Lt. Hollingshead started his retreat from the dwelling for the same reason [the increase in temperature]. It is documented that Lt. Hollingshead stated on the air *"We need to open up, it's getting real hot in here"* at 02:31:57 hours, this is 7 seconds prior to BC 1's message at 02:32:04 hours *"Where is my RIT, I got a man trapped in the front"* at 02:32:04 hours.

BC. Reese Wingate, BC-1 [Incident Commander]

"I arrived on the scene passing the front of the dwelling and gave initial report. Parked at NE corner of Fleet and Macon Sts...Made a quick pass of alley to observe conditions in the rear. Updated conditions and requested 2nd alarm. Engine 41 reported getting real hot they were backing out. Acknowledged same. Quick release of smoke, heat and pressure caused door to close trapping members. Requested two additional medic units. Requested Safety Officer to do a PAR".

Note: BC-1 also realized and documented the sudden temperature change *"Quick release of smoke, heat and pressure."* He did not know at that time the events that took place in the dwelling that caused the door to shut.

Capt. Jeffery Jakelski, Truck 3

Myself and members of Truck 3 went to the rear of the fire building to perform operations. Upon our arrival, we found heavy fire conditions in the rear with all 3 floors involved. We assisted engine companies with advancing hose lines and began ladder and ventilation procedures. Due to arcing wires and heavy fire, we laddered the exposure on side "D" and vented the windows and roof. We continued on the roof and eventually put a hose line in service on the roof after members were cleared from the inside".

Note: Capt. Jakelski was the first officer in the rear. He was responsible for giving the initial size up from the rear and directing initial operations including the placement of ladders, hose lines, and personnel.

FF Dennis Bentz, Engine 5

I was assigned to the pipe position on Engine 5 on the above incident. After advancing a 1-3/4" down the alley to the rear of the dwelling, I saw a large volume of fire engulfing the whole rear of the house-basement, 1st floor and 2nd floor. I put on my SCBA, entered the yard, and began flowing water towards the 2nd floor exterior before getting permission to direct the stream into the basement. However, due to power lines arcing overhead, I was ordered back to the alley where I continued to flow water to all parts of the dwelling, with other companies, until the fire was extinguished.

Notes: 1) During the interview process of this investigation FF Bentz stated that he was throwing water into the basement when the Captain of Truck 3 stated on the air "I got access to the basement and first floor" at 02:30:44 hours and continued throwing water from that time until the fire was extinguished. 2) Members felt a sudden change in temperature, which initiated their retreat from the dwelling and subsequently became trapped behind the front door at 02:32:04 hours. 3) The statement "with other companies" indicates that there may have been more than one line directed into the rear openings at this time.

Lt. Donald Schafer, Engine 5

"Engine #5 proceeded down Fleet Street from Oldham Street. I, in full turnouts and SCBA, stretched a 1 3/4 hose line down the alley to the rear of the dwelling and proceeded to cover exposures knowing companies were coming in though the front. After confirming that all members were evacuated from the front, I directed member on the pipe to direct water into the dwelling"

Note: During the interview process of this investigation Lt. Schafer was asked how he confirmed that all members were evacuated from the dwelling. He stated that he was not

Note: During the interview process of this investigation Lt. Schafer was asked how he confirmed that all members were evacuated from the dwelling. He stated that he was not sure how he received the information, but he was sure everyone was out. At no time did the Incident Commander or any other member operating in the front of the dwelling, make an announcement or statement that members were out of the dwelling. Lt. Schafer stated in his interview that he was not with his pipe man at all times because he was down the alley assisting with establishing a water supply.

FF/PM Nancy Goeb, Squad 11

"After donning my SCBA I went to the front of the fire building to find heavy black smoke coming out of the second floor window as well as the front door. I entered the building through the front door and found members on their knees attempting to locate the fire. I was able to get approximately 3 feet inside before I heard members screaming, "It's hot, it's hot". I stopped and assisted pulling hose into the dwelling. There was a sudden flash of heat and I turned and exited the front door. I turned back to find that the front door was partially closed and members were trapped behind it. I assisted in pulling the three members out and then assisted the members of Medic 10 with the treatment of one of them".

Note: FF/PM Goeb recalls the same event *"There was a sudden flash of heat"*. Members in front of and inside of the dwelling, all recall the sudden increase of temperature. This happened just prior to FF Roberts running into FPA Butler and the front door, causing the members to become trapped and after water was introduced into the rear openings of the dwelling at 02:30:44 hours.

Contributing Factors

As with most tragedies, there were numerous factors and circumstances that contributed to the final outcome of this event. Outlined below are the key factors that have been investigated and agreed upon by committee members.

F.F. Robert's Self-Contained Breathing Apparatus [SCBA]:

- 1) Based upon all witness information, it was determined that FF Roberts' SCBA, including the face piece, were on at the time he entered the dwelling.
- 2) FF Roberts performed firefighting activities within the smoke-filled structure for a period of time, during which the SCBA was operating.
- 3) At some point between the times that FF Roberts was at the top of the stairs [to the second floor] and when he fell unconscious on top of FPA Butler against the front door, his face piece was either removed or was knocked off.
- 4) The following facts were identified with respect to FF Roberts' SCBA:
 - a) The cylinder was turned off when recovered by the safety officer. No one reported turning off the bottle.
 - b) There were no eyewitness reports of the mask being in free-flow (as would have occurred in an accidental removal) or of anyone re-setting a free-flow.
 - c) There was 1800 PSI remaining in FF Roberts' bottle when recovered by the safety officer. [FPA Butler's had 2500 PSI and FPA Maddox's had 3500 PSI].
 - d) There was no physical damage to the face piece that would indicate that FF Roberts ran into something that could have knocked it off. The mask was found with only one top and one bottom spider strap tightened.
 - e) The National Institute of Occupational Safety and Health [NIOSH] tested FF Roberts' SCBA and found it to be below standards in some areas of the test but none that would contribute to the total failure of the SCBA or interrupt the flow of air that he was receiving. [See NIOSH report in appendix D and BCFD test results in appendix E].

5) Other issues considered:

- a) If FF Roberts ran into something hard enough to knock his face piece off, he most likely would have fallen at that point.
- b) It is possible that FF Roberts inadvertently turned his bottle off while attempting to open it further than he initially opened it upon entering the dwelling. Several facts were discovered to substantiate this theory.
 - i. FF Roberts sustained serious burns to his right hand. This could indicate that he removed his glove in an attempt to completely open the valve.
 - ii. His SCBA was discovered with 1800 PSI of air remaining in the cylinder, indicating that it was turned off sometime between his entry into the dwelling and subsequent collapse at the front door.
 - iii. No one on the fire ground recalls hearing his mask in a free flow state.
 - iv. No one on the fire ground reported turning off Roberts' cylinder or resetting the mask to stop a free flow of air.

F.F. Roberts' Gloves:

- 1) FF Roberts was wearing gloves when he entered the dwelling.
- 2) Based on burns he sustained to his right hand, FF Roberts removed the glove on his right hand, apparently while still near the top of the steps.
- 3) There are several possible explanations for removing the glove:
 - a) He removed the glove to get a better feel of the valve knob of his SCBA.
 - b) He removed it because he was receiving burns from something in the glove [hot embers, steam burns].
- 4) The gloves recovered at the fire ground cannot be positively identified as those belonging to FF Roberts.

F.F. Roberts' Hood:

- 1) All indications are that FF Roberts was **not** wearing a hood when he entered the dwelling. The following items were considered when arriving at this conclusion:
 - a) The thermal injuries on his face and head indicate the lack of a hood at the time the burns were received.
 - b) No hood was ever recovered at the scene.

- c) During a re-creation of this scenario, it was not possible to remove the face piece when worn with a hood over the face piece and helmet in place.
[See photos on ensuing pages]

2) Other issues considered:

- a) Given the conditions described by others, it may have been too hot to enter the dwelling without a hood.
- b) During initial interview, FPA Mattox reported seeing FF Roberts with his hood on. During a subsequent conversation with committee members he stated that he was not sure if what he saw was actually a hood. He reported that what he saw could have been the earflaps of the helmet liner and/or the collar of the turnout coat.

The Events/Circumstances Surrounding FF Roberts, FPA Mattox, and FPA Butler Retreating from the Dwelling:

- 1) FF Roberts was on the pipe, at or near the top of the stairs to the second floor. FPA Mattox was next in line just a few steps behind FF Roberts. FPA Butler was third in line, at or near the bottom of the stairs.
- 2) FPA Mattox felt FF Roberts rush past him on the stairs. FPA Mattox turned to follow him out. At this point he started to feel burning to his entire left arm.
- 3) Once in the hallway leading to the front door, FF Roberts ran into FPA Butler and they both fell to the floor (with FF Roberts on top of FPA Butler) against the front door, effectively cutting off their escape route. FPA Butler reported that at this point FF Roberts was motionless, lying in a prone position, and appeared to be unconscious.
- 4) FPA Mattox ended up on the floor near the door with FF Roberts and FPA Butler.
- 5) Members on the outside were able to force the door open far enough to remove FPA Mattox and FPA Butler in 46 seconds. They were unable to remove FF Roberts until the door was removed from its hinges. Based on video and audio evidence it took an additional 2 minutes and 51 seconds to accomplish this task. FF Roberts remained in the dwelling, without a mask, unconscious, for a total of 3 minutes and 37 seconds.
- 6) When removed from the dwelling FF Roberts was non-breathing and in full cardiac arrest. His SCBA was on his back, but his face piece was off and he was not wearing a hood.



Re-enactment photo showing properly donned helmet, hood, and facepiece. The proper order for donning this equipment is facepiece, hood, and then the helmet.



Re-enactment photo showing the difficulties encountered when trying to remove the facepiece when it is properly donned with hood(hood worn over facepiece)and helmet .



Re-enactment photo showing the ease in which the facepiece can be removed when not worn properly. This photos depicts the improper donning of the facepiece over the hood.

The Events/Circumstances Surrounding the RIT:

- 1) The Incident Commander failed to designate a RIT [Rapid Intervention Team]. The Incident Commander did not realize this until the need for one arose. Once it was determined and announced that all occupants were accounted for, a RIT should have been established.
- 2) The fact that a fully equipped and dedicated RIT was not established delayed the rescue efforts. Members of the initial attack crews were the rescuers. Members had to retrieve forcible entry tools from the closest truck while the other members attempted to force the door without tools. Members also stated that they had to take turns forcing the door because they became exhausted from their efforts.

Hose Lines In-Service in the Rear While Members Were Inside the Dwelling:

- 1) Based upon interviews, video, and photographic evidence, it is clear that at least one hose line was throwing water on the fire in the rear during the time that FF Roberts, FPA Mattox, FPA Butler, and others were in the dwelling.
- 2) Review of video, photographs, radio transmissions, and interviews of members indicates that the hose line operations in the rear contributed to the increase in heat reported by members on the inside. [Note: This increase in heat is caused by the rapid conversion of water to steam and disruption of the ventilation process]

Fire Breeching the Stairwell Wall:

- 1) Investigation at the scene immediately after the fire indicated that the fire on the first floor breeched the south wall of the stairwell leading to the second floor.
- 2) This breach occurred in the area occupied, at some point, by FF Roberts.
- 3) The committee believes that the failure of this wall was also a contributing factor to the rapid increase in temperature reported by members inside of the dwelling.

The Disparate Conditions Noted in the Rear, as Opposed to Those Found in the Front:

- 1) Units arriving at the front of the dwelling found heavy black smoke conditions, but no visible fire.
- 2) Units arriving at the rear found heavy fire conditions from the basement to the second floor.

- 3) Members in the rear stated in their interviews they assumed that the entire building was involved in fire because of the heavy fire conditions observed in the rear. This led them to believe that no one would be making an interior attack.
- 4) During the cause and origin portion of the investigation it was noted that the basement, first, and second floors were partitioned in such a way that caused the fire to spread in a somewhat unusual way. The voids created by this partitioning allowed the fire to spread vertically [from the basement through the roof] in the rear of the dwelling without any significant horizontal spread [rear to front]. [See the "cause and origin" report in appendix A]

Note: The following photographs show the conditions in the front and rear of the dwelling. These photos were captured from video footage taken by neighbors.



514 South Macon Sterrt Box 11-7 October10,2006
DVD capture Frame #0199 of 12915



514 South Macon Sterrt Box 11-7 October10,2006
DVD capture Frame #0552 of 12915



514 South Macon Sterrt Box 11-7 October10,2006
DVD capture Frame #0703 of 12915



514 South Macon Sterrt Box 11-7 October10,2006
DVD capture Frame #10653 of 12915



Rear of 514 South Macon Sterrt Box 11-7 October10,2006
Frame capture of .AVI short clip
Frame # 0154 of 0321
02:32 Hours



Rear of 514 South Macon Sterrt Box 11-7 October10,2006
Frame capture of .AVI short clip
Frame # 0185 of 0321
02:32 Hours



Rear of 514 South Macon Sterrt Box 11-7 October10,2006
Frame capture of .AVI short clip
Frame # 0313 of 0321
02:32 Hours

The Structure

The structure located at 514 South Macon Street was a brick, two-story middle of the group, occupied dwelling. This dwelling was built in the year 1920 and is typical of the "row homes" found in Baltimore City. Initially built as a single-family home, this dwelling was later remodeled to accommodate two separate apartments [year unknown]. Although it was still designed for two apartments at the time of the fire, the occupants were using the entire dwelling as a single family home. There were two separate electric meters for this dwelling. According to Baltimore Gas & Electric [BG&E] records the electric meter that supplied the first floor was terminated on April 17, 2001. Additionally, BGE terminated the electric meter for the second floor on September 22, 2006, thereby leaving the entire dwelling without electric service.

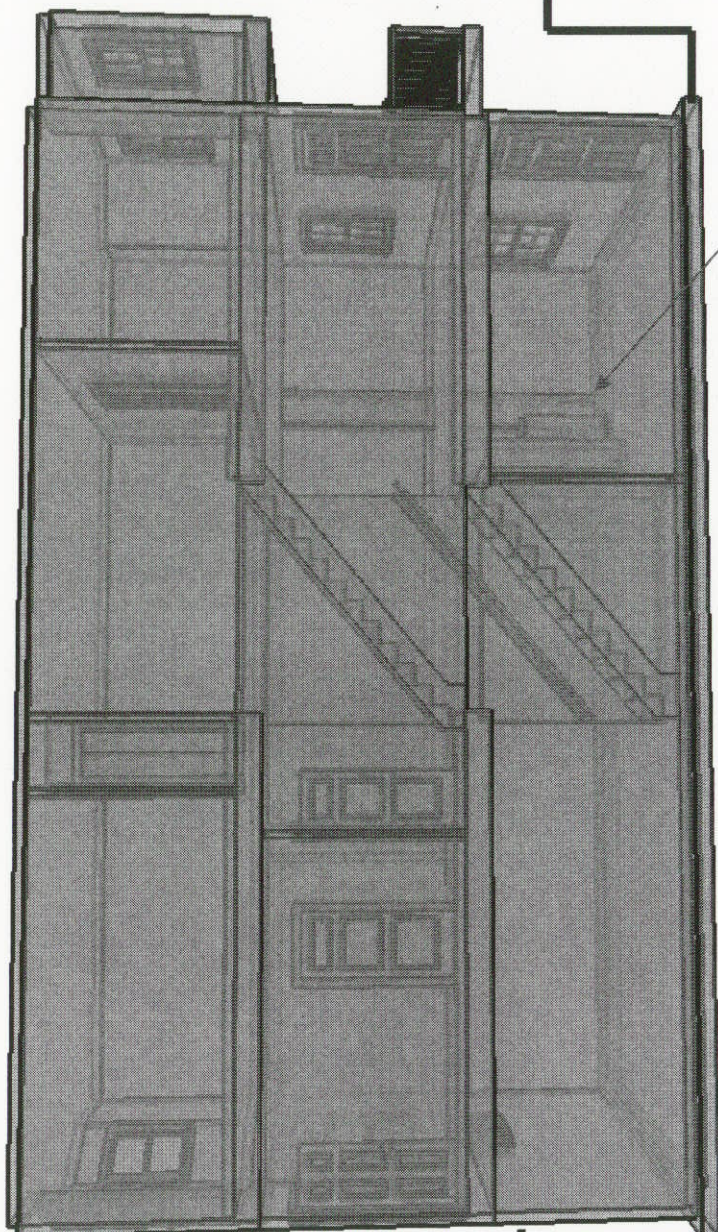
The investigation to determine the cause of the fire discovered that both electric meters on the exterior rear of the building had been illegally altered to allow electricity to flow into the dwelling. [For more detailed information see page 6 of the ATF investigation report in appendix B]

The occupant of the dwelling admitted in an interview with fire investigators that he ran an electric wire from the second floor electric panel to the electric panel on the first floor. He did so because the electric service on the first floor had been terminated on 4/17/01. The occupant also admits to having knowledge that both outside electric meters had been illegally re-connected, but did not admit to making the illegal hook-ups himself.

The occupant also stated that he had lived in this dwelling (514 South Macon St.) for approximately 7 years, and that approximately 1 year after moving in he was sitting on the couch on the first floor when a ceiling tile fell on him. He then discovered that the joists above the ceiling tiles were heavily charred, indicating a previous fire in the structure. The occupant also states that upon further investigation the basement and second floor ceiling joists were found to be in the same condition.

After the previous fire, which according to interviews with surrounding neighbors is believed to have taken place in the mid 1970's, the dwelling was remodeled with 2"x 3" lumber and thin laminated paneling covering the walls on all three floors. The new walls were constructed in front of the original walls, thereby creating a 3 inch [and in some cases a 6 inch] void between the two walls. Additionally, all fire-damaged ceiling joists were concealed from view by drop-ceiling acoustical tiles.

It is believed the above-mentioned remodeling greatly contributed to the fuel load [thin laminated paneling], the rapid vertical extension of the fire [large open voids behind the walls and ceilings], and the early collapse of the first and second floors, along with the roof area [exposed joist with previous fire damage]. [See figures 4, 5 and 6 on the following pages].



SIDE CHARLIE

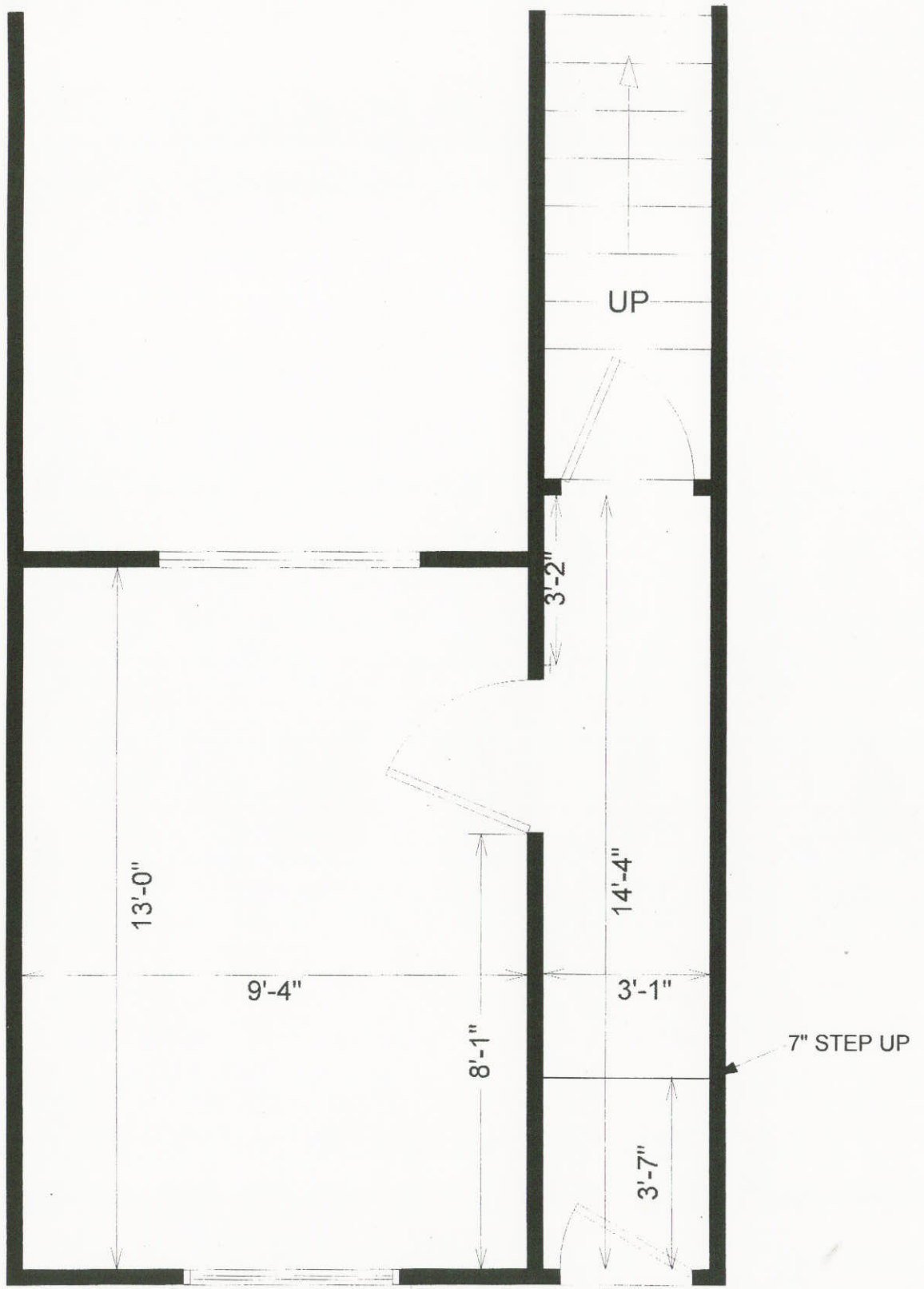
FIRE ORIGIN

DELTA SIDE

SIDE ALPHA

BASEMENT

514 S. MACON STREET



514 S. Macon Street
Baltimore, Maryland

Front View



Rear View



Aerial View



Hallway leading to stairs to 2nd floor



Area of origin (basement)



Radio Transmissions and Presumed Activities

The following section will show specific radio transmissions and activities that the committee believes were taking place at the time. To reach these presumptions the committee considered normal fire ground tactics; interviews of members involved; and evidence gathered from eyewitnesses such as, audio recordings, video tapes, and photographs.

TIME	UNIT ON AIR	RADIO TRANSMISSION	PRESUMED ACTIVITIES
02:24.48	BC-1	<i>I got a two story middle of group, heavy smoke showing, I'll be command.</i>	BC-1 is first arriving unit.
02:25.14	SQ-11	<i>Got a hydrant, Macon and Eastern Avenue.</i>	SQ11, first Engine, leading off
02:25.28	BC-1	<i>Battalion Chief I you can make this a working fire</i>	BC1 just checked conditions in the rear.
02:25.36	E-41	<i>Engine 41 covering Squad 11</i>	E 41, second Engine, covers hydrant
02:26.07	T-20	<i>Truck 20 to command we need a medic unit for a civilian who jumped out second floor window.</i>	T 20, first arriving truck finds injured civilian. Positions truck and prepares to raise ladders to ventilate.
02:26.14	M-20	<i>Medic 20 right behind you</i>	M 20 responds to T20's call for medic and begins treating patient.
02:26.18	BC-1	<i>Give me a second Medic</i>	BC 1 is now in front of dwelling
02:26.56	E-51	<i>We also have a plug at Eastern and Macon</i>	E 51 leads off
02:27.02	BC-1	<i>Give me the Rescue and another Truck on this working fire.</i>	BC 1 continues his size-up
02:27.34	Un-known	<i>Charge that line</i>	By this time it is believed that SQ 11 & E 41 are preparing to enter the dwelling.
02:27.59	BC-1	<i>At this time, I have a two story brick middle of group fully involved. Uh-got extension in the rear on both sides at this time.</i>	SQ11 & E 41 are entering dwelling though the front door with 1-3/4" hose line.

02:28.41	BC-1	<i>Stop right there, I need you in the rear.</i>	BC 1 to E 5, E 5 & T 3 arriving.
02:28.47	T-3	<i>Are all the civilians out of the building?</i>	Captain of T 3 asks this while walking down the alley to rear.
02:28:58	BC - 1	<i>Unable to ascertain at this time.</i>	Responding to T 3.
02:29.06	T-3	<i>All right 3 Truck to command in the rear we got uh heavy fire in the rear, arcing wires, I need BGE, we're unable to gain access right now.</i>	T 3 in rear gives size-up, E 5 stretching a 1-3/4" line from south end of alley.
02:29.21	E-51	<i>51 portable 1 to 51 portable 2 add one section to (unintelligible) section.</i>	E 51 stretching a 2-1/2" with gated wye from north end of alley.
02:29.31	T-3	<i>Alright Chief, ah this fire is extending into the second floor dwelling side D. side B.</i>	T 3 continuous size-up in the rear.
02:29.48	BC-1	<i>We have two occupants out of the building. They are reporting no one else inside at this time.</i>	SQ 11 and E 41 are inside the dwelling advancing a line to the second floor.
02:30.10	T-3	<i>Truck 3 in the rear to Battalion 1. Are you sending companies in because they got heavy fire in the rear, We can hit it good from the rear.</i>	Charged hose lines in the rear at this time. Flame impingement on rear of exposures on side bravo and delta.
02:30.19	BC-1	<i>Don't push it in on them I got companies advancing in the front just check out the exposures.</i>	Companies in the rear are believed to be wetting down the exposures at this time.
02:30.29	T-3	<i>Alright message received they will not go in we got fire in the basement too.(unintelligible)</i>	Companies are inside the dwelling attempting to locate the fire.
02:30.38	BC-1	<i>You got access to the basement?</i>	BC 1 trying to ascertain if units in the rear had access to the basement.
02:30.44	T-3	<i>That is correct. I got access to the basement and first floor.</i>	It is at this time the committee feels that water is being thrown into the basement from the alley.
02:30.55	BC-1	<i>Take a line to the basement. 3 Truck take a line to the basement from the rear.</i>	Company enters the rear yard with a 1-3/4" line while directing water into the basement.
02:31.05	T-3	<i>All right, I'm going to go with 5 Engine. Did you call BGE?</i>	T 3 and E 5 are attempting to gain access to the basement.
02:31.11	BC-1	<i>BGE both sides also give me a second alarm.</i>	BC1 requesting electric and gas emergency service from BGE and also requesting a second alarm of fire.

02:31.23	E-51	<i>E51-1 to E51-2 shut that 3" line down.</i>	E 51 hooking up a wye on a 3" line to supply 2 1-3/4" lines in the rear alley north end.
02:31.32	T-3	<i>Truck 3 to Battalion 1, be advised that we cannot get there we got too many hot wires in the rear.</i>	Through the interview process it is confirmed that water is still being applied in the basement.
02:31.57	E-41	<i>We need it opened up; It's getting real hot.</i>	Lt. Hollingshead tells others "Let's get out of here it's too hot" as he crawls out of the dwelling via the front door.
02:32.04	BC-1	<i>Where is my RIT, I got a man trapped in the front.</i>	BC 1 realizes that he has at least one trapped fire fighter. Notice only 7 seconds elapsed since the above statement. Lt. Hollingshead stated that "as soon as I crawled out the door shut behind me."
02:32.11	T-3	<i>Truck 3 to Battalion 1 – Pull em out, we're going to lose the rear.</i>	Capt. of T 3 stated at this point "the fire in the rear is really off and intense now."
02:32.18	E-41 (?)	<i>(inaudible).....down</i>	The word "down" is heard on the tape from what appears to be Lt. Hollingshead.
02:32.30	BC-2	<i>Battalion 2 Communications – Have the first and second company on the second alarm bring a line into 5 Engine down on Fleet and Macon.</i>	Members in front of the dwelling are trying to open front door.
02:32.55	BC-1	<i>Battalion Chief 1 – Give me two additional medics. Have the second medic unit report to the front of the building – two injured Firefighters.</i>	FPA Butler then FPA Mattox are pulled though the narrow opening of the front door.
02:33.35	BC-1	<i>Battalion Chief 1 to Communications – Who's my RIT?</i>	FF Roberts still lying unconscious behind front door.
02:33.50	Dispatch	<i>Engine 5 - Battalion Chief 1 – Engine5</i>	Confusion starts over which unit was the designated RIT.

02:33.55	BC-1	<i>Battalion Chief 1 to Engine 5 – I need you in the front.</i>	Members are still attempting to open the front door.
02:34.01	BC-2	<i>Battalion Chief 2 to Battalion 1 – Be advised that Engine 5 is committed in the rear.</i>	BC 2 advises BC 1 that E 5 is committed and therefore is unable to serve as the RIT. The committee believes confusion about the RIT began with the incorrect order of dispatch.
02:34.10	BC-1	<i>Alright. Alright. Operating as the RIT in the rear. They were dispatched as the RIT.</i>	This is when BC 1 realizes he does not have a designated RIT in place.
02:34.23	BC-2	<i>OK – I have enough people back here that can assume the RIT in the rear if that is OK with you.</i>	FPA Butler and Mattox are being treated by Medic 20. Members are trying to remove front door.
02:34.32	BC-1	<i>I need two of them in the front to assist the Medic units</i>	BC 2 sending two members to the front.
02:34.43	E-50	<i>Engine 50 to Battalion Chief 1 – Be advised we are at Foster and Macon trying to get down Macon to get Engine (unintelligible) put a line into Engine 5 at this time.</i>	E 5 worked off of their tank, E 50 dumped their tank into E 5 after grabbing a dead hydrant.
02:35.00	Dispatch	<i>Your second alarm companies are: Engine 27, Engine 35, Engine 57, Squad 54, Truck 1. Copy.</i>	Communications providing list of units assigned to the 2 nd alarm.
02:35.16	BC-1	<i>Negative – Give it to me again</i>	BC 1 asked for a repeat of the 2 nd alarm assignments. Members are still attempting to remove the front door.
02:35.21	Dispatch	<i>Your second alarm companies are: Engine 27, Engine 35, Engine 57, Squad 54, Truck 1.</i>	Communications repeats 2 nd alarm assignments.
02:35.41	E-41	<i>We have a down Firefighter – (unintelligible)</i>	FF Roberts pulled out of front door.
02:35.41	BC-1	<i>Battalion Chief 1 to EMS 5</i>	EMS 5 states “when BC1 calls for me on the radio I was right next to him and that’s when they were pulling FF Roberts down the steps to the sidewalk”.
02:35.47	BC-1	<i>Battalion Chief - Give me my second alarm companies again.</i>	Members are removing FF Roberts’s gear.
02:36:00	Dispatch	<i>Second alarm companies are: Engine 27, Engine 35, Engine 57, Squad 54, Truck 1.</i>	Communications responding to BC 1’s request.
02:36.09	BC-1	<i>The first two engines to the front bring water, first two engines to the rear. First truck to the front, second truck to the rear.</i>	BC1 assigns second alarm units. Members have placed Roberts on a stretcher.

02:36:28	S.O.	<i>Safety officer 2 – I'm on the scene</i>	Emergency care being given to FF Roberts
02:37:07	BC-1	<i>Have the Safety officer do a PAR at this time.</i>	BC1 instructing the Safety Officer to do a PAR. The S.O. does not acknowledge this order.
02:38.01	BC-2	<i>Battalion Chief 2 to Battalion Chief 1</i>	
02:38.06	BC-1	<i>Go ahead, 2.</i>	
02:38.10	BC-2	<i>We're right at the back of the building; we're bailing water in the basement and the first floor.</i>	BC 2 informing BC 1 that water is being directed on the fire in the rear. Poor communications between officers in the rear results in lines being directed into the 1 st floor rear, which was contrary to Command's orders.
02:38.20	BC-1	<i>I don't want it in the first floor, got a line in the front, I want it in the basement.</i>	B.C 1 emphatically telling BC 2 to re-direct the water because an interior attack is still under way. [It is at this time the roof is opened for vertical ventilation]
02:39:08	BC-1	<i>Told you I need a PAR immediately, I got missing Firefighters.</i>	BC1 repeating order to conduct a PAR because first order was not acknowledged.
02:39:23	Disp.	<i>Units on box alarm 11-7 stand by for a PAR for Safety Officer 2.</i>	PAR begins 2 minutes and 16 seconds after first order by BC1.

Incident Time Line by Communications

TIME	UNIT ON AIR	RADIO TRANSMISSIONS
02:24.48	BC-1	<i>I got a two story middle of group, heavy smoke showing, I'll be command.</i>
02:25.14	SQ-11	<i>Got a hydrant, Macon and Eastern Avenue.</i>
02:25.28	BC-1	<i>Battalion Chief 1 you can make this a working fire</i>
02:25.36	E-41	<i>Engine 41 covering Squad 11</i>
02:26.07	T-20	<i>Truck 20 to command we need a medic unit for a civilian who jumped out second floor window.</i>
02:26.14	M-20	<i>Medic 20 right behind you</i>
02:26.18	BC-1	<i>Give me a second Medic</i>
02:26.56	E-51	<i>We also have a plug at Eastern and Macon</i>
02:27.02	BC-1	<i>Give me the Rescue and another Truck on this working fire.</i>
02:27.34	Un-known	<i>Charge that line</i>
02:27.59	BC-1	<i>At this time, I have a two story brick middle of group fully involved. Uh-got extension in the rear on both sides at this time.</i>
02:28.41	BC-1	<i>Stop right there, I need you in the rear.</i>
02:28.47	T-3	<i>Are all the civilians out of the building?</i>
02:28.58	BC - 1	<i>Unable to ascertain at this time.</i>
02:29.06	T-3	<i>All right 3 Truck to command in the rear we got uh heavy fire in the rear, arcing wires, I need BGE, we're unable to gain access right now.</i>
02:29.21	E-51	<i>51 portable 1 to 51 portable 2 add one section to (unintelligible) section.</i>
02:29.31	T-3	<i>All right Chief, ah this fire is extending into the second floor dwelling side D. side B.</i>
02:29.48	BC-1	<i>We have two occupants out of the building. They are reporting no one else inside at this time.</i>
02:30.10	T-3	<i>Truck 3 in the rear to Battalion 1. Are you sending companies in because they got heavy fire in the rear, We can hit it good from the rear.</i>
02:30.19	BC-1	<i>Don't push it in on them I got companies advancing in the front just check out the exposures.</i>
02:30.29	T-3	<i>All right message received they will not go in we got fire in the basement too.(unintelligible)</i>
02:30.38	BC-1	<i>You got access to the basement?</i>
02:30.44	T-3	<i>That is correct. I got access to the basement and first floor.</i>
02:30.55	BC-1	<i>Take a line to the basement. 3 Truck take a line to the basement from the rear.</i>
02:31.05	T-3	<i>All right, I'm going to go with 5 Engine. Did you call BGE?</i>

02:31.11	BC-1	<i>BGE both sides also give me a second alarm.</i>
02:31.23	E-51	<i>E51-1 to E51-2 shut that 3" line down.</i>
02:31.32	T-3	<i>Truck 3 to Battalion 1, Be advised that we can not get there we got too many hot wires in the rear.</i>
02:31.57	E-41	<i>We need it opened up, It's getting real hot.</i>
02:32.04	BC-1	<i>Where is my RIT, I got a man trapped in the front.</i>
02:32.11	T-3	<i>Truck 3 to Battalion 1 – Pull em out, we're going to lose the rear.</i>
02:32.18	E-41	<i>(inaudible)down</i>
02:32.30	BC-2	<i>Battalion 2 Communications – Have the first and second company on the second alarm bring a line into 5 Engine down on Fleet and Macon.</i>
02:32.55	BC-1	<i>Battalion Chief 1 – Give me two additional medics. Have the second medic unit report to the front of the building – two injured Firefighters.</i>
02:33.35	BC-1	<i>Battalion Chief 1 to Communications – Who is my RIT?</i>
02:33.50	Dispatch	<i>Engine 5 - Battalion Chief 1 – Engine5</i>
02:33.55	BC-1	<i>Battalion Chief 1 to Engine 5 – I need you in the front</i>
02:34.01	BC-2	<i>Battalion Chief 2 to Battalion 1 – Be advised that Engine 5 is committed in the rear.</i>
02:34.10	BC-1	<i>All right. All right. Operating as the RIT in the rear. They were dispatched as the RIT.</i>
02:34.23	BC-2	<i>OK – I have enough people back here that can assume the RIT in the rear if that is OK with you.</i>
02:34.32	BC-1	<i>I need two of them in the front to assist the Medic units</i>
02:34.43	E-50	<i>Engine 50 to Battalion Chief 1 – Be advised we are at Foster and Macon trying to get down Macon to get Engine (unintelligible) put a line into Engine 5 at this time.</i>
02:35.00	Dispatch	<i>Your second alarm companies are: Engine 27, Engine 35, Engine 57, Squad 54, Truck 1. Copy.</i>
02:35.16	BC-1	<i>Negative – Give it to me again</i>
02:35.21	Dispatch	<i>Your second alarm companies are: Engine 27, Engine 35, Engine 57, Squad 54, Truck 1.</i>
02:35.41	E-41	<i>We have a down Firefighter – (unintelligible)</i>
02:35.41	BC-1	<i>Battalion Chief 1 to EMS 5</i>
02:35.47	BC-1	<i>Battalion Chief - Give me my second alarm companies again.</i>
02:36.00	Dispatch	<i>Second alarm companies are: Engine 27, Engine 35, Engine 57, Squad 54, Truck 1.</i>
02:36.09	BC-1	<i>The first two Engines to the front bring water, first two Engines to the rear. First Truck to the front second Truck to the rear.</i>
02:36.28	SO-2	<i>Safety Officer 2 – I'm on the scene</i>
02:37.07	BC-1	<i>Have the Safety Officer do a PAR at this time</i>
02:37.15	E-41	<i>Meet me in the front. Engine 41-Meet in the front.</i>
02:37.25	AC-2	<i>Air Cascade-Eastern and Macon. Air Cascade to Engine 27.</i>
02:37.30	BC-1	<i>We need an additional EMS officer on the fireground.</i>

02:37:35	Dispatcher	<i>Message received.</i>
02:37.40	BC-1	<i>-Ah-What Medic I got coming?</i>
02:37.48	Dispatcher	<i>You have Medic 9, Medic 10; Medic 10 is showing on the scene, Medic 9 is enroute.</i>
02:38.01	BC-2	<i>Battalion Chief 2 to Battalion Chief 1</i>
02:38.06	BC-1	<i>Go ahead, 2.</i>
02:38.10	BC-2	<i>We're right at the back of the building; we're bailing water in the basement and the first floor.</i>
02:38.20	BC-1	<i>I don't want it in the first floor, got a line in the front, I want it in the basement.</i>
02:38.29	BC-2	<i>Message received.</i>
02:38.39	BC-2	<i>Got a lot of flames on the second. Floor. Can we hit the second floor?</i>
02:38.46	BC-1	<i>Stand-by</i>
02:39.0	BC-1	<i>Battalion Chief 1 to safety officer-</i>
02:39.05	SO2	<i>Safety Officer 2 go ahead.</i>
02:39.08	BC-1	<i>Told you I need a PAR immediately, I got missing Firefighters.</i>
02:39.15	SO2	<i>Safety Officer 2 to Communications-announce on Charlie 1 we're going to do a PAR.</i>
02:39.23	Dispatcher	<i>Units on box alarm 11-7 stand by for a PAR for Safety Officer 2.</i>
02:39:29	Dispatcher	<i>Truck 20 Portable 2 Open Mic-Truck 20 Portable 2 open Mic 2:39, Rescue 1 Portable 2 Open Mic-Rescue 1 Potable 2 Open Mic. All units on second alarm be advised check for open mike. All units' second alarm, check for open mic 2:40.</i>

Investigation into the Cause and Origin of the Fire

Members of the Baltimore City Fire Department Fire Investigation Unit, Baltimore City Police Department Arson Unit, and the Bureau of Alcohol, Tobacco Firearms, and Explosives [ATF] conducted the investigation into the cause and origin of this fire immediately. The investigation was initially hampered by a collapse of the roof, first floor, and second floor. Heavy equipment was utilized to assist the investigators expose the area of origin. In less than 36 hours it was determined that the cause of the fire was an electrical fault in a hot water heater in the rear of the basement. It was also determined that the house was powered by an illegal electrical hookup in the rear of the dwelling [see the BCFD investigation report in appendix A and the ATF investigation report in appendix B].

Investigation Time Line for 514 S. Macon St.

10/10/06 - 0236 hours: Notified by working fire, started investigation.

10/10/06 - 0240 hours: Started interviews with civilians, occupants, on the scene and at Johns Hopkins Bay View Medical Center. Interviews conducted by Capt. Carl Bull FIB-6, Capt Ronald Hudgins (FIB training), Police Arson Detectives Ed Vogt and Steve Wagner.

10/10/06 - 0355 hours: Division Chief Theodore Saunders arrived.

10/10/06 - 0400 hours: Division Chief Saunders authorized assistance of ATF; Detective Ed Vogt contacted ATF at Chief Saunders request.

10/10/06 - 0405 hours: Fire scene shut down (limited access) by Chief Saunders and Detective Ed Vogt.

0445 hours: ATF personnel Matthew Varisco, Gregory Der and Gregory Hine arrived.

0455 hours: Started interviews of Fire Department personnel in Mobile Command Unit.

10/10/06 - 0500 hours: Started investigation of cause and origin in reported address with Police Arson Detective Ed Vogt, ATF agent Gregory Der, and FIB #6 Captain Carl Bull / ATF agents Matthew Varisco and Gregory Hine continued interviews in Mobile Command Unit.

10/10/06 - 0800 hours: ATF agents notified ATF Electrical Engineer John Allen, he arrived at 1030 hours.

10/10/06 - 1530 hours: Briefing with Fire Investigators, Police Arson Investigators, and members of ATF.

10/10/06 - 1600 hours: Scene turned over to District Police Officers for scene security.

10/11/06 - 0700 hours: Continued investigation into cause and origin.

10/11/06 -0900 hours: Crane started to dig out with assistance from BCFD Special Operations Command (SOC) team headed by Chief Joseph Brocato.

10/11/06 - 1530 hours: Briefing with Fire Investigators, Police Arson investigators and members of ATF.

10/11/06 - 1600 hours: Scene turned over to District Police officers for scene security.

10/12/06 - 1000 hours: Arrival of National Institute for Safety and Health Specialist Steve Berardinelli and Matt Bowyer.

Protective Clothing Summary

The Fire Department provides protective equipment that meets applicable National Fire Protection Association (NFPA) Standards. The protective ensemble includes:

Turn-out coat

Turn-out pants

Helmet

Suspenders

Hood

Gloves

Boots

Personal Alert Safety System [PASS] Device

The protective clothing worn by FF Roberts, FPA Butler, and FPA Mattox was visually inspected on the scene by Chief Safety Officer William Jones and Lieutenant John Boblits. Both are members of the Fire Department Safety Office. The clothing was then secured by the Safety Office. The protective clothing manufacturer (Lion Apparel) was then asked to provide technical assistance. Their inspection was conducted under the supervision of the Fire Department and members of Maryland Occupational Safety and Health (MOSH). The Department's inspection of the protective clothing was consistent with the manufacturer's observations. The manufacturer's protective clothing report can be found in Appendix F. The BCFD and MOSH reports can be found in appendix G and H respectively)

Findings and Recommendations

One of the main objectives of this committee was to make recommendations that will serve to improve the emergency operations of the BCFD, while enhancing the safety of the department's members. It is the hope of this committee that these recommendations will prevent another tragic incident such as this one.

Finding # 1:

The Incident Commander Failed To Realize That A Designated RIT Was Not In Place Until The Need For One Arose

Background:

The BCFD RIT policy changed 10 months prior to this incident (see copies of BCFD RIT policies in appendix H). The fact that there was a report of people trapped allowed deviation in the RIT procedure per MOP 602-8. However, once all occupants were accounted for, the IC should have designated a RIT because an interior attack was in progress and because of the intensity of the fire.

Recommendations:

1. **Incident Commanders must ensure that a RIT is on the scene and in position to provide immediate assistance prior to fire fighters entering a hazardous environment. All RIT procedures must be in accordance with the BCFD Manual of Procedure 602-8, Operations Memo 17-06, and NFPA Standard 1500. [See appendices I and Q]**

NFPA Standard 1500, section 8.8.7 states that " At least one dedicated rapid intervention crew/company shall be standing by with equipment to provide for the rescue of members that are performing special operations or for members that are in positions that present an immediate danger of injury....."

Source: NFPA 1500 (2002). Standard on fire department safety and health program. Quincy, MA: National Fire Protection Association.

2. **Incident Commanders must maintain accountability [both by location and function] for all personnel at the scene.***

Accountability for all fire fighters at the scene is essential and constitutes one of the Incident Commander's most important duties. The Incident Commander should track the location and assignment of all units operating at the fire scene and communicate with unit officers at each level of operations.

** Source: NFPA 1561(2002). Standard on emergency services incident management system. Quincy, MA: National Fire Protection Association.*

Finding # 2:

The Dwelling Was Not Properly Ventilated Prior To Fire Fighters Entering The Building. This Contributed To The Intense Heat And Heavy Smoke Conditions Encountered By Those Members On The Interior Attack Lines

Background:

Members entering the building with the initial attack lines did so before the dwelling was properly ventilated. Ventilation of the roof was delayed due to difficulties in the proper placement of T20, because of parked vehicles on the narrow street. Additionally, windows on the front of the dwelling were not ventilated in a timely manner. Because of the intense heat, the Lieutenant of E41 reported that he left the dwelling to ensure that all windows had been removed. When he found one still intact, he ventilated that window himself before re-entering the dwelling.

Recommendation:

- 1. Unit Officers and Incident Commanders must ensure that adequate ventilation of the structure is achieved before interior attack lines are advanced.**

Chapter 10 of the **Essentials of Fire Fighting* states that "ventilation must be closely coordinated with fire attack." This chapter on ventilation practices goes on to state that "the importance of ventilation cannot be overlooked. It increases visibility for quicker location of the seat of the fire. It decreases the danger to trapped occupants by channeling away hot, toxic gases. Ventilation also reduces the chance for flashover or back-draft.

Finding #3:

At Least One Hose Line Was Directed On The Fire In The Rear Of The Dwelling While Members Were Inside The Building. This Action Contributed To The Intense Heat Experienced By Members On The Interior Attack Lines

Background:

During the initial stages of the fire, there were a total of four hand lines in the rear of the dwelling. It is unclear how many of those lines were attempting to extinguish the fire while members were inside the building. Although at least one of these lines was alternately directed at the fire building and the exposure buildings, the committee did determine that at least one line was throwing water on the fire in the rear while an interior attack was in progress.

Recommendations:

1. **Unit Officers and Incident Commanders must ensure that offensive and defensive operations are not being conducted simultaneously.**

Flowing water through ventilation openings [a defensive operation] destroys the effectiveness of those openings. More importantly, doing so increases temperatures on the inside because the steam that is created cannot vent through the ventilation opening. Consequently, the heat from the steam and the fire is pushed back against the fire fighters that are inside the building. Chapter 10 of *Essentials of Fire Fighting* provides this warning: "Never operate any type of fire stream through a ventilation hole during offensive operations. This stops the ventilation process and places interior crews in serious danger."

2. **Incident Commanders must maintain accountability [both by location and function] for all personnel at the scene.**

Accountability for all fire fighters at the scene is essential and constitutes one of the Incident Commander's most important duties. The incident commander should track the location and assignment of all units operating at the fire scene and communicate with unit officers at each level of operations. Communications between Incident Command and units working in the various sectors of the incident are imperative. Timely and accurate sharing of information of fire conditions and operations being conducted will significantly reduce the chances of offensive and defensive operations being carried out simultaneously.

Source: Essentials of fire fighting (4th Edition). Stillwater, OK. Fire Protection Publications.

Finding #4:

The Unit Officers Of The Members On The Initial Interior Attack Line Did Not Maintain Direct Supervision And Control Of Those Members

Background:

The first interior attack line was manned by three members from two separate units. Neither officer was with their respective member on the attack line while it was being advanced into the dwelling. As conditions deteriorated and the order to retreat was given, that order had to be passed from member to member until it reached FF Roberts at the top of the stairs.

Recommendation:

- 1. Unit officers must maintain accountability of members under their command at all times. Officers in charge of engine companies must remain with and maintain control of attack lines in accordance with MOP 602-1.**

It is important for the unit officer to maintain accountability for the members under his or her command at all times, and to know their location and function on the fire scene. Engine company officers must be positioned directly behind the member on the pipe [nozzle] to direct the stream and to warn of unsafe conditions in accordance with BCFD Manual of Procedure 602-1. In regards to engine company operations MOP 602-1 states "Unit commanders shall remain near nozzles to direct members; regulate the size, force, and direction of streams; and prevent unnecessary damage."

- 2. All members must take responsibility for their role in the operational functions of their assigned unit.**

FF Roberts had a responsibility to stay with his unit and function in his assigned role. MOP 602-1 [Fire Ground Operations for Engine Companies] states that "*It is the responsibility of each member to exercise the appropriate control dictated by their rank in the implementation of these operating procedures.*" [See appendix K]

Finding #5:

All Indications Show That FF Roberts Was Not Wearing a Protective Hood When He Entered the Dwelling

Background:

FF Roberts' injuries indicate that he was not wearing a hood when he advanced the first attack line into the dwelling. Additionally, members who provided aid to FF Roberts reported that he was not wearing a hood when he was removed from the dwelling. In spite of repeated searches, no hood was ever recovered from the fire scene.

Recommendations:

- 1. Unit officers shall be held accountable for the safety of the members under their command. Unit officers must ensure that the condition of all personal protective equipment [PPE] of their members meets the minimum standard for structural fire fighting as established by the BCFD Manual of Procedures. Additionally, unit officers and incident commanders must ensure that members under their command are wearing all PPE in accordance with MOP 360-1.**

Unit officers must ensure that members under their command have the appropriate PPE at the beginning of each shift and strictly enforce departmental policies regarding the proper use and care of that equipment. Supervisors at all levels of command must ensure that members are wearing all PPE while operating at fires and other emergencies.

2. Members working at fires or other emergencies must properly wear full protective gear in accordance with MOP 360-1.

Each member must take responsibility for his or her personal safety. Each member should be familiar with and adhere to all policies and procedures regarding the proper use and care of their PPE. Members should ensure that their PPE is functional and readily available. Any deficiencies should be immediately reported to respective unit officer for corrective action.

Finding # 6:

The Incident Safety Officer Arrived On The Scene 11 Minutes and 50 Seconds After BC1 Gave His Report of "Heavy Smoke Showing," and 4 Minutes and 24 Seconds After the First Report of Trapped Fire Fighters

Background:

At the time of this incident the BCFD policy did not require the safety officer [SO] to respond with the initial box alarm assignment. At the time the SO responded on "working fires" and to any incident that he or she deemed necessary.

Recommendation:

- 1. The SO must be dispatched with the initial box alarm assignment, or any other initial dispatch as necessary.**

This new dispatch policy is already in effect as a result of this incident.

Finding # 7:

It Took 2 Minutes and 16 Seconds After BC 1's Directive For The SO To Begin Conducting a Personnel Accountability Report [PAR]

Background:

BC1 requested a PAR at 2:37:07 with no acknowledgment from the SO or fire communications. BC1 made a second request for a PAR at 2:39:08 and received acknowledgment from the SO at 2:39:15 and the PAR began at 2:39:23.

Recommendations:

- 1. The Incident Commander and the on-scene SO must be accountable for ensuring that a PAR is conducted in a timely and efficient manner. When conducting a PAR all members should conform to MOP 602-9.**

In accordance with MOP 602-9, all sectors, divisions, groups, and unit officers must maintain a constant awareness of the position and function of all personnel assigned to operate under their supervision.

- 2. Fire Communication Dispatchers must monitor all fire ground radio communications and ensure that all requests and orders are addressed.**

Dispatchers must be aware of all requests and/or orders that are made during an emergency operation, including unit-to-unit transmissions. It is imperative that dispatchers alert units to radio transmissions that may have been overlooked or not heard by the unit to which the request or order was directed.

Finding # 8:

The Initial Verbal Dispatch of Units Was Given In An Incorrect Order By The Fire Communications Dispatcher

Background:

During the course of the investigation, it was determined that the verbal dispatch was given in an incorrect assignment order. This mistake may have contributed to confusion on the fire ground. The member working dispatch at the time of the incident was a paramedic detailed in from the field. This member was apparently not familiar with the current policy in place for RIT. The dispatcher working the fire ground talk group also errantly informed Command that Engine 5 was assigned RIT. The policy in place clearly delineates that the Incident Commander will designate the RIT unit. No RIT unit was designated at the time of this request, and there is no clear reason why the dispatcher responded that it was Engine 5.

Recommendation:

- 1. The Fire Communications Bureau [FCB] must ensure that all policy and procedure additions or changes will be brought to the attention of all members, including members that are routinely assigned to FCB from other units within the BCFD.**

This should be implemented through on-going training, review of electronic orders and directives, and signing of hard copy orders that are on site at FCB.

Note: The Department recently began training suppression members to the level of dispatcher. The main duty function of these newly trained members is that of Fire Ground Dispatcher. This will allow the Department to have seasoned firefighters monitoring fire ground operations. This added level of operational knowledge will increase awareness of critical situations, and aid Fire Communications to more efficiently identify and help correct safety concerns.

Finding #9:

Failure on the Part of Command and Unit Officers to Provide Adequate Command and Control of the Incident Through Timely and Efficient Communications

Background: Although an interior attack was underway in the front, Command ordered an attack line in the rear taken to the basement at 02:30.55. Specific instructions were not given to the officer in the rear to flow water at that time, but because of conditions, it was assumed that command wanted a water stream directed into the basement. This should have been verified with command. Command gave no warning to the interior crews advancing from the front that conditions could change rapidly due to a line opening up into the rear of the basement, nor was this effort coordinated between units. In addition, other units and command officers that arrived in the rear, seeing one hand line in service, assumed that streams could be directed into the rear of the dwelling. Additional lines were placed in service at both the basement and first floor levels. The Captain of Truck 3 did not order these lines shut down and none of the officers received orders to flow water into the first floor. This flow continued until 02:38:29 when the Battalion Chief in the rear gave an update to command that included where hose lines were being directed. The order to flow water only into the basement was clarified most emphatically by command at that time.

Recommendation:

- 1. Command officers must coordinate all aspects of the fire ground. This can be accomplished most effectively through radio communications. The officer in the rear must know exactly what tactics are to be employed throughout the entire operation.**
- 2. Incident Commanders [Battalion Chiefs & Battalion Commanders] should be provided with a Command Aide.**

Aides assist with tracking the assignments, location, and functions of units operating at the scene of an emergency. This additional set of eyes and ears are an invaluable tool to successfully managing fire ground operations and could help prevent deaths or serious injuries in the future.

This fact is noted in several fire fighter death investigation reports released by the National Institute of Occupational Safety and Health [NIOSH]. Those reports state that *"Fire departments should provide the Incident Commander with a Command Aide."*

[See NIOSH report F99-03 in appendix S].

Finding #10:

Possible Improper Operation of SCBA Bottle Valve

Background:

When FF Roberts was removed from the dwelling his SCBA bottle valve was turned off. It apparently had been accidentally turned off by FF Roberts, or by some other means. It is possible that FF Roberts may have only "cracked" open the valve after engaging his second stage regulator to his face piece. Assuming this possibility, FF Roberts' demand for air could have exceeded the maximum airflow achievable by the SCBA under this condition. This scenario was live tested at the Fire Academy, and found to be possible. With the bottle valve partially opened, the instructor conducting the test was able to collapse his face piece with each inhalation during rigorous activity. FF Roberts may have mistakenly turned off his bottle while attempting to open it fully once his demand for air exceeded what air was available.

Recommendation:

1. All members are to refer to Training Manual 101 for proper SCBA operation and to continue monthly SCBA training.

Finding #11:

Inadequate Inspections of Members Personnel Protective Equipment [PPE]

Background:

FF. Roberts' PPE had been re-issued to him from Fire Supply prior to this incident with the name of the original user still inside the gear. Member failed to properly label his gear with his name and assignment.

Recommendations:

1. Fire Supply must inspect all used turn-out gear and insure that the name of the previous owner has been removed prior to re-issuing the gear.

2. All members must adhere to MOP 363-5. Work uniforms, personal protective clothing and all other uniform items shall be marked with members' name and unit assignment.
3. Unit officers shall regularly inspect the PPE of all members under their command to ensure compliance with MOP 363-5.

Finding #12:

F.F Roberts' Did Not Have His Portable Radio in His Possession When He Entered the Dwelling

Background:

The Safety officer was responsible for collecting all of Roberts' gear. During this process it was discovered that Roberts' portable radio, hood [the hood is discussed in detail elsewhere in this report], and flashlight were unaccounted for. The portable radio was later discovered in the cab of Engine 41 with no apparent damage.

Because he did not have his radio, F.F. Roberts could not hear the reports of a basement fire as well as other transmissions that could have influenced his decisions about the interior attack. Both Mattox and Butler heard the radio transmission reporting fire in the basement. They relayed that information to Roberts and the decision to evacuate was then made.

Note: The radios that were carried by FPA Butler and FPA Mattox did sustain damage as a result of the heat they encountered [see photos in appendix G].

Recommendations:

1. All members who are assigned a portable radio must insure that it is in proper working order and have it in their possession whenever they enter a hazardous or potentially hazardous environment.
2. Portable radios should be set to the appropriate fire ground channel and monitored during emergency operations. Members must be prepared to use the radio to answer a PAR, transmit a call for assistance, or respond to a call for assistance.

Finding #13:

Advancements in the technology of PPEs allows fire fighters to withstand temperatures well in excess of those previously afforded by less-modern gear

Background:

The design and materials used in today's PPEs completely encapsulates the fire fighter and temporarily protects him or her from extreme temperatures. This allows the fire fighter to enter environments that would have been untenable in years past. This protection can lead to a false sense of security as fire fighters advance further into hazardous environments under extreme conditions. Tests have shown that these extreme conditions lead to a build up of heat between the barriers in the gear. This heat build up begins after approximately 1 minute of exposure and continues to increase until it reaches a critical point at which time the fire fighter is at severe risk for burns. This critical point occurs after approximately 6 minutes of exposure time*. By the time this delayed reaction occurs, the fire fighter has advanced further into the building, requiring more time to escape and thereby increasing the time he is exposed to the extreme heat. As a result, the BCFD and other fire departments have seen an increase in burn injuries to members in areas of the body that are not directly exposed to heat.

* Source: *Health and Safety Guidelines for Fire Fighter Training*. University of MD Center for Fire Fighter Safety Research and Development. College Park, MD

Recommendations:

- 1. All levels of training [academy, unit, and battalion level] should include reminders to members of the inherent dangers of this delayed heat transfer.**

Members must be aware that a fully encapsulated fire fighter may not have a true sense of extreme conditions when he or she first enters a fire building.

- 2. Fire ground interior operations should not begin until the fire building has been properly ventilated.**

Effective and timely ventilation can reduce the amount of heat that members are exposed to during interior operations.

Finding #14:

The Front Door of the Dwelling Was Not Secured in the Open Position as Members Began Interior Operations

Background:

Although there is no written policy or procedure that requires this action, the committee believes that doing so may have prevented the door from closing and trapping the members inside. Doors can be secured in the open position by using chocks, hose straps, or other methods.

Note: Each battalion has been supplied with a sufficient number of chocks for distribution to members who need them.

Recommendation:

- 1) All members should be reminded of the importance of securing [in the open position] all egress doors during interior operations.

Conclusion

The tragic event that occurred in the early morning hours of October 10, 2006 has impacted the Baltimore City Fire Department. As a department our goal is to learn from this tragedy and maximize the positive influence it can have on our department; **we must seize the opportunity that this crisis presents**. With this report we have taken a critical look at what happened, identified and analyzed the mistakes that were made, and recommended corrective actions. The effectiveness of these corrective actions requires personal accountability and the proper oversight and enforcement of all policies and procedures by officers on all levels of command. We must all work together as a department to insure that we individually and collectively take responsibility for our personal safety and the safety of others at all times.

This incident should serve as a reminder that the decisions we make about how we conduct training, the actions that we take during an emergency, and how we care for and use our protective gear, can be the deciding factor in who gets to go home to their family at the end of their shift or whose name will be on the next line of duty death report.

Appendix A

Baltimore City Fire Department, Fire Investigation Bureau Report

**FIRE INVESTIGATION BUREAU
PRELIMINARY REPORT****BALTIMORE CITY FIRE DEPARTMENT****LOCATION INVESTIGATED**

STREET #: 514 **STREET NAME:** S. Macon **ROOM / APT / SUITE** N/A **ZIP CODE:** 21224 **INCIDENT #** 2006122597

DATE OF FIRE: 10/10/2006 **DAY OF WEEK:** Tuesday **BOX AREA:** 11-7 **BATTALION:** 1ST
TIME OF FIRE: 2:22 **WEATHER CONDITIONS** Night/Clear

PROPERTY TYPE DWELLING **STORIES:** 2 **MATERIAL** FRAME

OWNER: T & L Properties LLC **OWNER TELEPHONE:** (443)904-6373 **ADDRESS:** 440 South Drew Street Baltimore, Md. 21224

OCCUPANT: Ms. Linda Propst **OCCUPANT TELEPHONE:** **OCCUPIED AS:** DWELLING **OCCUPATION:**

VEHICLE MAKE **VEHICLE MODEL:** **VEHICLE YEAR:** **LICENSE #:**

LOCATION PREVIOUS FIRES: **OWNER PREVIOUS FIRES:** **OCCUPANT PREVIOUS FIRES:**

CONTENTS: \$10,000.00

STRUCTURE: \$50,000.00

TOTAL DAMAGES: \$60,000.00

SMOKE DETECTOR: **INVESTIGATION REQUESTED BY** 2ND ALARM

OF SMOKE DETECTORS:

POINT OF ORIGIN: BASEMENT **CAUSE:** ELECTRICAL FAULT **ALARM LEVEL** 2ND

PRIMARY INVESTIGATOR: FIB 6 CAPTAIN CARL M. BULL **DATE OF INVESTIGATION:** 10/10/2006 **TIME OF INVESTIGATION:** 2:36

POLICE OFFICERS NAME: Bailey **CAR #:** 2A31

CENTRAL COMPLAINT #: 2J4958 **CRIME LAB #:** Peters 5829

POLICE ARSON: Detective Edward Vogt Car# 41 **ATF:** Mathew Varisco 4018

POINT OF ORIGIN DESCRIPTION:

The fire originated in basement of the 2 story brick dwelling.

NARRATIVE:

Investigation revealed the fire originated in the rear basement area and extended from that location. The fire caused heavy charring to the rear basement ceiling joists below the 1st floor rear room causing the joists to fail, collapse. The fire extended to the exterior rear via the rear basement door and rear basement window. The fire caused heavy burning and charring to the rear wooden porch and extended vertically to the 2nd floor overhang. The fire also extended from the interior rear basement to the 1st floor via the interior basement stairs, the interior sewage pipe chase and eventually the rear collapsed ceiling joists. The fire then extended to the 1st floor rear and middle room causing heavy burning to both rooms and contents. Heavy burning and flame impingement to the 1st floor rear ceiling joists caused the 2nd floor to collapse down on the already collapsed 1st floor. The fire extended to the 2nd floor via the interior stairs, pipe chase, and the collapsed 2nd floor. The fire caused heavy burning to the 2nd floor middle room and contents. The fire then extended to the 2nd floor middle roof area causing a partial collapse of the dwellings roof at that location. The fire extended to both adjacent dwellings causing burning to the 2nd floor rear of each, the damages are as follows: 512 S. Macon owned by Carlos V. Linares, of same address \$15,000.00 structure and \$5,000.00 content. 516 S. Macon owned by Harry J. Sharkey 1203 Dulaney Woods Rd. Cockeysville, MD. 21030 \$5,000.00 structure and 0 content.

LOCATION INVESTIGATED

STREET #:	STREET NAME:	ROOM / APT / SUITE	ZIP CODE:	INCIDENT #
514	S. Macon	N/A	21224	2006122597

Examination of the dwelling of the reported address revealed the fire originated in the rear basement area closer to the south wall (side Bravo) near the floor level between the washing machine and the water heater. Examination of the washing machine revealed it was plugged in at the time of the fire. Examination of the metal housing of the washing machine revealed that it sustained more burning to the left side the side closer to the electric water heater. Examination of the water heater revealed the two metal covers that covered the upper and lower thermostats and heating elements were not in place at the time of the fire. Examination of the lower thermostat revealed that it had suffered sever damage to the terminal screw to the thermostat and melting copper to that screw, which is consistent with a loose or failed connection at the thermostat wire terminal. The observation of the damage at this point is consistent with the damage caused by electrical fault. Examination of the area of origin revealed there was a large amount of clothing on the floor around the area of the water heater. Examination of other potential ignition sources in the room of origin revealed they did not cause the fire. My examination of the dwelling revealed the walls on all 3 floors were covered with thin laminated paneling. The paneling contributed to the rapid fire spread and the fuel load. These paneled walls were set 3 inches up to 6 inches in some locations off the original brick and plaster walls. This condition greatly contributed to the rapid extension of the fire. Examination of the dwellings utilities revealed there was two electric meters for this apartment style dwelling. Examination of both meters revealed an illegal electrical hook-up at both meters locations. Examination of the interior eclectic panel in the rear basement area revealed it sustained heavy burning. There was no natural gas in the dwelling.

PRIMARY INVESTIGATORS OPINION:

It is the opinion of this investigator that this fire was a result of electrical fault.

INVESTIGATOR

DATE

REVIEWING OFFICER

DATE

**BALTIMORE CITY FIRE DEPARTMENT
FIRE INVESTIGATION BUREAU
FIELD NOTES**

LOCATION INVESTIGATED

STREET #:	STREET NAME:	ROOM / APT / SUITE	ZIP CODE:	INCIDENT #
<u>514</u>	<u>S. Macon</u>	<u>N/A</u>	<u>21224</u>	<u>2006122597</u>
DATE OF FIRE: <u>10/10/2006</u>		TIME OF FIRE: <u>2:22</u>		

FIELD NOTES::

Member of Engine Company #41, Lieutenant Michael Hollingshead stated that there was thick heavy black smoke coming from the front door upon their arrival.

Captain Jeff Jakelski of Truck Company #3 stated that conditions in the rear of the reported address was fire showing basement, 1st. floor and 2nd. Floor.

Occupant Mrs. Linda Propst, D.O.B. 6/28/49, stated that she had fallen asleep on her bed in the 2nd floor front room at approximately 0030 hours on 10/10/06, and was awoken by smoke, she woke her boy friend and ran down the interior steps and through the front door. Mrs. Linda Propst also related to me that she had lost the house in a foreclosure and was planning to move this Friday, 10/13/06.

Occupant Mr. Bill Preller D.O.B. 6/13/54 stated that he was awoken by his girl friend (Linda Propst) while sleeping in his bed 2nd floor front room and he ran to the window and opened it because the smoke was so bad, he then climbed out on the window sill, and jumped to the street. Mr. Bill Preller also related to me that they had lived in the dwelling for about 7 years and he had no known trouble with the water heater. He also stated that after living in the dwelling for about a year one day the drop ceiling fell on him while he was sitting on the first floor couch, he then discovered that the joists above the drop ceiling were heavily charred indicating a previous fire, he stated he also checked the basement and 2nd floor and found those joists in similar condition. Mr. Bill Preller stated that all walls, basement, 1st floor and 2nd floor were covered with paneling and all ceilings were of drop ceiling type. Mr. Bill Preller also stated that his cats would go behind the 2nd floor walls and come out in the basement through the drop ceiling. Mr. Bill Preller also related to me that on the evening before the fire he did move clothing and furnishing in the room of origin, he was pushing these items to the side up against the washer and water heater to create a path to the rear basement door to move other personal items to a U-Haul truck located in the alley.

BG&E Mr. Allen Cruss, badge #35010 informed me that the reported address was an all electric house that had 2 electric meters in the rear, The meter that was for the 1st floor was terminated by BG&E on 4/17/01, and the meter for the 2nd floor was terminated by BG&E on 9/22/06.

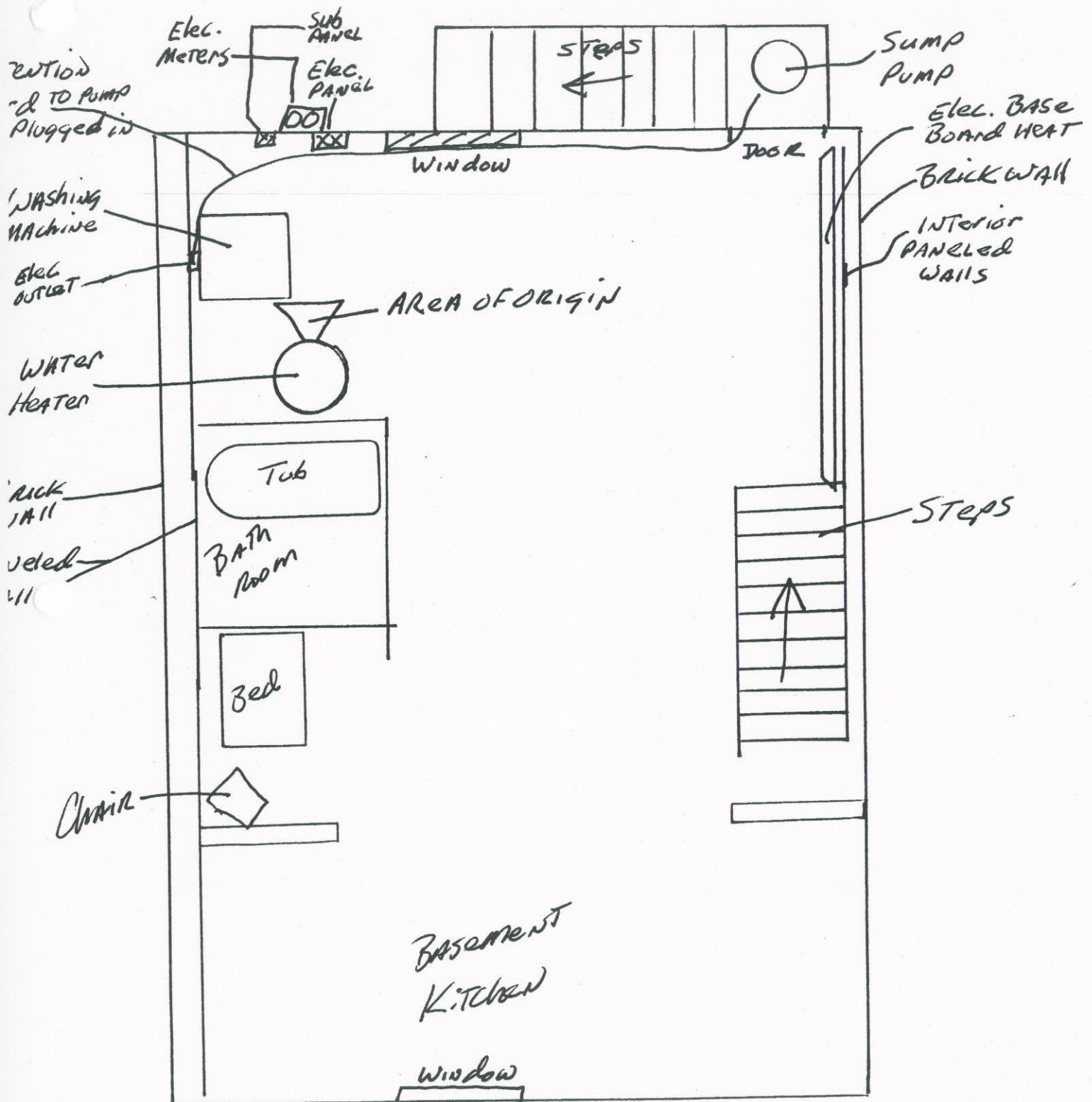
Mr. Wayne Bowen, badge # 29818, phone # 410-291-3684, Theft Investigator for BG&E and Mr. Tony Hess, badge #33426, phone # 410-440-0204 Theft Investigator for BG&E. Both stated after investigating the electric meters in the rear of 514 S. Macon St. that both electric meters were jumped at the meters location.

Mr. William Conkling, Baltimore City Building Inspector, condemned 512, 514, and 516 S. Macon Street.

514 S. MACON Street

- Basement -

N →



- Side A -

NOT DRAWN TO SCALE

Capt. Carl M. Bull, FBI #6

10-10-06 @ 2:22 hrs.

2-2 Box 11-7

INC #06122509

Appendix B

**Findings of the United States Department of Justice –
Bureau of Alcohol, Tobacco, Firearms and Explosives
(ATF)**

Title of Investigation:

4 S. MACON STREET

Investigation Number:

761010-07-0004

Report Number:

14

FIRE SCENE EXAMINATION

BACKGROUND:

- On October 10, 2006, at approximately 2:22 a.m., firefighters from the Baltimore City Fire Department responded to Box Alarm 11-7 for a row house fire, with possible entrapment, at 514 S. Macon Street. Upon their arrival, firefighters observed heavy smoke coming from the front of the residence and heavy fire to the rear. Firefighters initiated fire suppression activities and an interior fire attack. During firefighting operations, one firefighter suffered mortal injuries and two other firefighters were severely burned. The fire extended throughout the structure. A partial collapse of the structure ensued before it was brought under control by firefighters. Investigators from the Baltimore City Fire Department, Baltimore City Police Department and ATF responded to the scene to conduct an investigation into the origin and cause of the fire. The fire caused extensive damage which necessitated the use of a crane to remove materials for examination and scene safety. The investigation of the origin and cause of the fire determined that the fire originated in the basement and was caused by an electrical event.

PARTICIPATING PERSONNEL:

- The following personnel participated in the fire scene was examination / investigation:

Baltimore City Fire Department (Fire Investigation Bureau)

Captain Carl Bull
Captain Mike Roth
Captain Ron Flynn
Chief Theodore Saunders
Lieutenant Jim Rubling

Baltimore City Police Department

Detective Ed Vogt
Detective Steve Wagner
Crime Scene Tech. Peters

ATF

SA/CFI Gregg Hine
Electrical Engineer John Allen
SA Matt Varisco
SA Noah Slackman

Prepared by: Gregg A. Hine	Title: Special Agent, Baltimore I (Arson) Field Office	Signature:	Date:
Authorized by: Donald A. Toll	Title: Group Supervisor, Baltimore I (Arson) Field Office	Signature:	Date:
Second level reviewer (optional): Gregory K. Gant	Title: Special Agent in Charge, Baltimore Field Division	Signature:	Date:

SA/CES Rachel Ehrlich-Ellis
SA/BT Scott Fulkerson
Det./TFO Greg Der

WITNESS STATEMENTS:

Fire Discovery

3. A resident who lives directly across from 514 S. Macon Street observed smoke coming from the residence and contacted "911" to report the fire. This resident also utilized a handheld video recorder to capture firefighting activities on Macon Street (*investigators later reviewed this video recording*).
4. Another resident located at 512 S. Macon Street told investigators that she was asleep on the second floor of her residence when she awoke to the odor of smoke. The resident exited her house via the front door and then saw her neighbor, Linda Propst, sitting on her front steps at 514 S. Macon Street with smoke coming from the residence.
5. A series of additional "911" calls were received by the Baltimore City Fire Communications Center from residents calling to report the fire.

Occupants

6. Investigators learned that Linda Propst and William Preller originally rented the first floor apartment and then subsequently purchased the row house and moved to the second floor apartment. However, due to financial difficulties, Preller and Propst failed to make mortgage payments in 2005-2006 which resulted in the foreclosure of the mortgage and the transfer of ownership (an eviction proceeding were initiated on October 3, 2006). At the time of the fire, Propst and Preller advised that they were the sole occupants of the residence and had full access to the interior.
7. Mr. Preller advised investigators that the electrical service to the residence had been terminated by Baltimore Gas and Electric Company. However, Preller stated that he was responsible for the unauthorized restoration of electrical service to the structure.
8. On the evening of October 9, 2006 William Preller and Linda Propst moved a portion of their personal items from the basement of 514 S. Macon Street and placed them into a rental truck. Mr. Preller described the numerous household items that remained stored in the rear of the basement (utility room). He stated that there was only a narrow pathway that allowed access to the rear basement door due to stored items.
9. At approximately 2:20 a.m. both Propst and Preller were asleep on the second floor of the residence in the front bedroom. Preller stated that he awoke to Propst's screams and found that the bedroom was filled with thick dark smoke. Preller stated that he could not find his way to the staircase or locate Propst and then returned to his bedroom and opened a window. Preller explained that he exited the second floor window and jumped to the sidewalk below. Propst advised investigators that she was able to exit the second floor via the interior stairway and then exited the residence through the front door.
10. With regard to the electric water heater, Preller stated that there were no known problems with the unit which was located in the basement of the residence. Preller also stated that he believed that the two cover panels were on the water heater at the time of the fire. He stated that he has not performed any work on the water heater and that to his knowledge it was functioning properly. In addition, Preller stated that he had not detected any absence of hot water

in the residence. Preller provided investigators with a detailed account of the water heater's location, as well as all other electric devices in the basement.

11. Mr. Preller also told investigators that the residence had obviously suffered a previous fire and that he noticed that several of the damaged wood floor joists remained in place. Mr. Preller did not know when the fire occurred, but believed that it was several years ago.

Owner

12. At the time of the fire, 514 S. Macon Street was owned by Loukas Loukakis. Investigators learned that Loukakis purchased the residence on August 30, 2006 from Bruce Garvi. Loukakis purchased the property for \$115,000 and insured it with Ohio Casualty Insurance Company. Loukakis stated that he had never met the occupants (Propst or Preller) and that Bruce Garvi had previously initiated the eviction proceedings to remove the occupants.

Fire Suppression

13. The following Baltimore City Fire Department units were initially dispatched to Box Alarm 11-7 at 2:22:52 a.m. by the Baltimore City Fire Communications Center.

Company

Squad 11

Engine 41

Engine 50

Engine 51

Engine 5

Truck 20

Truck 3

Battalion Chief 1

Battalion Chief 2

Medic 20

14. Battalion Chief 1 arrived on the scene at the front of 514 S. Macon Street and reported that heavy smoke was showing from the first and second floors.
15. Squad 11 was the first fire department apparatus to arrive on the scene at the front of the dwelling. Firefighters stated that upon their arrival, they observed heavy black smoke coming from the dwelling.
16. Engine 41 was the second engine to arrive at the scene, connecting to a hydrant (Eastern Avenue and S. Macon Street) to supply water to Squad 11.
17. Firefighter (FF) Allen Roberts, who was assigned to Engine 41, removed the 250' cross-lay preconnect (1 3/4") hose from Squad 11 and then advanced the hose to the front of the dwelling. At that point he was met by Firefighter Paramedic Apprentice (FPA) Mattox, also from Engine 41, and FPA Butler from Squad 11.
18. Additional firefighters continued to arrive on the scene and all reported heavy smoke conditions from the front of the structure. These firefighters assisted in movement of hose lines, laddering the structure and ventilating.
- Engine 51 was the first engine to arrive at the rear of the structure. Its crew reported heavy fire conditions in the

rear with flame impingement to the second floor. The crew from Engine 51 and Engine 5 subsequently placed a 1 ¾" hose line in service at the rear of the structure.

20. Due to the heavy fire conditions in the rear of the dwelling, no interior attack was attempted by firefighters at that location. However, firefighters did utilize hand lines to suppress and control the fire spread to the exposure dwellings. During these operations, it is possible that hose streams were directed into the rear of 514 S. Macon Street via the window openings on the first and second floors.
21. At the front of the dwelling, firefighters advanced a single 1 ¾" attack line inside the structure via the front door. The team advancing this hose line consisted of FF Roberts, FPA Mattox and FPA Butler. They moved into the hallway and stairwell to the second floor. As the interior conditions became untenable, these firefighters began to withdraw from the structure. However, during this process, FF Roberts' face piece became dislodged and he was quickly overcome by the toxic and superheated atmosphere.
22. FF Roberts quickly fell onto the hallway floor, just inside the front door. At that point, he was reportedly unresponsive. The position of FF Robert's body, within the narrow hallway limited the opening of the front door. FPA's Mattox and Butler were temporarily trapped within the structure. Fellow firefighters, at the front exterior of the dwelling were immediately aware of what had occurred. Firefighters were able to partially open the front door and assist with the extrication of FPA's Butler and Mattox. Firefighters then forcibly removed the front door from its hinges, which allowed access to FF Roberts, facilitating his removal from the dwelling. A waiting medic unit immediately administered aid to FF Roberts and he was transported to Bayview Hospital. However, the injuries sustained by FF Roberts proved to be fatal.
23. Firefighters continued in their efforts to suppress and contain the fire. During suppression activities, the rear portion of the first and second floors collapsed into the basement. Additional firefighting units were called to the scene and the fire was ultimately brought under control and extinguished.

BUILDING CONSTRUCTION:

24. 514 S. Macon Street was a two-story row house (middle of group) of ordinary construction approximately 13'x 44' in size. According to Baltimore City property records, the structure was originally built in 1920. The dwelling is located on the west side of Macon Street and faces east. An alley is located to the rear of the structure and is parallel to Macon Street.
25. All exterior walls of 514 S. Macon Street were of brick construction. Floor joists supporting the first and second floors were positioned across the structure in a north/south orientation and supported by columns. Wood decking was attached to the floor joists, providing the floor system. A shallow pitch (flat) roof structure was above the second floor.
26. The structure was built above a full basement. Interior access to the basement was made via an interior stairwell. An exterior basement door, located at the base of a shallow stairway (approximately three feet below grade) provided outside access to the basement from the rear yard.
27. The electrical meter base for the dwelling was located on the exterior of the rear/west wall. Electrical service to the utility pole on-site was active. Electrical service within the dwelling was also active at the time of the fire, due to the unauthorized bypass of a meter lockout device. There was no natural gas service at the dwelling.
28. All interior wall surfaces appeared to be finished with lightweight wood paneling. The ceilings were finished with a

suspended ceiling system with 2'x 2' lay-in tiles. The resident reported to investigators that several of the ceiling tiles were missing in the basement prior to the fire.

29. In the years prior to the fire, the row house was divided into two separate occupancies. The lower level unit was comprised of the first floor and basement. The upper unit was comprised of the second floor. At the time of the fire, the row house was solely occupied by Linda Propst and Bill Preller. Both individuals had lived in the row house for approximately seven years. At the time of the fire they had access to the entire dwelling.
30. There was no fire suppression system observed within the structure. The presence of working smoke detectors was not confirmed.

FIRE SCENE PROCESSING:

31. The scene examination began on the morning of October 10, 2006 subsequent to fire suppression activities. The exterior of the structure was initially examined. The front of the structure had a great deal of smoke staining at the window and door openings.
32. The rear exterior of the structure was heavily damaged by fire. A "V" pattern was evident on the rear exterior wall. The lowest point of the "V" pattern initiated at the basement level and extended up and across the exterior of the third floor.
33. Investigators initially entered the second floor master bedroom through the front windows with the aid of a ground ladder. This initial examination revealed moderate fire damage in the master bedroom, which appeared to be the result of fire extension from the first floor.
- The first floor living room (front) was examined by investigators and found to have suffered moderate thermal damage. This damage appeared be related to fire extension from the rear of the residence. A much greater degree of damage was observed in the middle and rear of the first floor. In addition, investigators observed that the rear portion of the first floor collapsed into the basement.
35. Based upon the damage assessment, fire patterns and the information provided by witnesses and responding firefighters, investigators determined that the fire originated at the basement level.
36. Investigators subsequently examined the interior of the basement and found that the most extensive fire damage was in the rear. In addition, the collapse of the first and second floor occurred in this area.
37. The front half of the basement was examined and found to have sustained smoke and moderate heat damage only. The first and second floors in this area were intact and less damaged than the rear of the structure. Fire damage to the wood framing within the basement revealed that the fire traveled from the rear of the basement to the front. Based upon observations within the basement, it was apparent to investigators that the front of the basement was not the origin of the fire.
38. On October 11, 2006 investigators initiated a systematic examination of the rear of the basement within the collapse zone. This area was identified as the origin of the fire and measured approximately 11' x 13' in size. Heavy equipment, provided by Williams Crane Service Inc., was called to the site and debris was removed at the direction of investigators.

As the top layers of debris were removed, remnants of furnishings from the first and second floor were examined by

investigators. It was noted that lower portions of furnishings or their undersides were more damaged, which was consistent with fire travel from below.

40. Debris continued to be removed and examined by investigators with the use of a crane. Additional items, which included furnishings, building materials, paints and paper products were removed by hand.
41. Investigators also examined the electrical panel and associated wiring in the basement. This included an electric water heater which was located approximately nine feet from the rear (west wall) and two feet from south wall. The water heater was subsequently removed from the basement with the use the crane and examined. This examination revealed an electrical failure at the thermostat (see Electrical Engineering Analysis section for additional details).
42. A visual examination of the interior wall surfaces revealed extensive damage on the south wall at the rear of the basement. This damage was consistent with damage on the first and second floors.
43. At the conclusion of the scene examination, all debris in the rear of the basement was removed, exposing the concrete floor. Investigators noted a linear pattern of spalled concrete from the vicinity of the rear door to the center of the area of origin. It is believed that this area was the only unobstructed portion of the floor.
44. Other than a failure noted at the water heater, no other accidental fire causes were identified by investigators.

ELECTRICAL ENGINEERING ANALYSIS

45. An electrical scene examination was conducted by ATF Senior Electrical Engineer John L. Allen, PE. The scene examination was conducted along with other investigators on October 10 and 11, 2006.

Examination of the exterior of the structure revealed that 120/240 volt, 60 hertz, single phase electrical utility service was provided from a pole mounted transformer located in the alley behind the structure. Aluminum service drop conductors were routed to an attachment point on the rear of the structure. A representative of Baltimore Gas and Electric disconnected the electrical service to the structure during the course of the fire by cutting the service drop conductors at the pole. The transformer serviced multiple structures and was not involved in the fire. No electrical anomalies were reported by adjacent residents prior to the fire.

47. A dual meter base was mounted on the exterior of the structure and contained two electrical utility meters. The structure, which was two stories above a basement, had been subdivided into two separate apartments at one time. The meter on the left side serviced the basement and first floor and the meter on the right side serviced the second floor. At the time of this examination the electrical utility meters were removed from the meter base and lying on the ground in front of the meter base. The meters were mechanically damaged but showed no evidence of direct flame or thermal impingement upon the exterior surfaces. The interior of the meter base was intact with no evidence of direct flame or thermal impingement upon the components. The interior of the right meter base had the remains of polymeric boots in the meter receptacles. The boots were placed on the meter connector blades and the meter reinstalled by BGE. This was done for failure to pay and disconnected electrical service to the second floor of the structure. Two lengths of stranded copper conductors (#2 AWG) were observed within the right meter base. The conductors were wedged into the meter receptacle clips behind the polymeric boots bridging the supply and load side. This bypassed the disabled electrical utility meter and restored electrical service to the second floor of the structure. The conductors were intact with no evidence of melted insulation or arcing at the interface between the conductor and receptacle clips. The gauge of the conductors was sufficient to carry the current load and the connections to the receptacle clips were adequate to not create an excessive voltage drop. The interior of the left meter base had the remains of polymeric boots in the meter receptacles.

The boots were placed on the meter connector blades and the meter reinstalled by BGE. This was done for failure to pay and disconnected electrical service to the basement and first floor of the structure. Two lengths of stranded copper conductors (#8 or #10 AWG) were observed within the left meter base. The conductors were wedged into the meter receptacle clips behind the polymeric boots bridging the supply and load side. This bypassed the disabled electrical utility meter and restored electrical service to the basement and first floor of the structure. The left side conductor was displaced from the receptacle clip. The conductor was arc melted. The left load side receptacle clip was partially arc melted. The conductors were inadequately sized for the current. The connection to the left load side receptacle clip was loose and failed. This failure caused the arcing and melting of the clip and the eventual separation of the conductor from the meter receptacle clip. This would result in the loss of one phase of the supply system. All 120 volt circuits fed by that phase would be de-energized and all 240 volt circuits would also be de-energized. This condition would not cause or exacerbate a failure of connected equipment that could result in a fire.

48. The right side meter supplied an aluminum service entrance cable that was routed through the basement wall immediately behind the meter base. The cable terminated at a main-disconnect circuit breaker in a steel surface-mounted box affixed to the basement utility room wall. From the main-disconnect, service entrance cable was routed up the wall to a distribution panel located on the second floor. The cable was melted and exhibited signs of direct thermal impingement upon the exterior. There was no evidence of electrical failure of the disconnect breaker or associated connections that could have caused the fire.
49. The left side meter supplied an aluminum service entrance cable that penetrated the basement wall immediately behind the meter base. The cable terminated in a distribution panel that contained a main 2-pole circuit breaker and various single and two pole branch circuit breakers. The panel was mounted in a steel box affixed to the interior basement utility room wall. The access door had burning and oxidation markings on the upper surfaces. The markings were consistent with the door having been open during the course of the fire. The main circuit breaker was installed at the uppermost position within the panel. The service cable attached directly to the breaker terminals. The upper terminal screw was discolored more severely than the immediately adjacent terminal screw. It was noted that the screw threads were not as fully engaged as the adjacent screw. There were no conductor remains in the upper terminal. The lower terminal retained a portion of the aluminum conductor that was melted. This indicated a loose or failing connection. However, there was no evidence the terminal experienced a catastrophic failure. There was evidence of an arc failure of the main circuit breaker. The metal panel was melted above the breaker on the right side access opening. The breaker was also fractured. Melted internal components were observed. This damage was too remote from the loose connection to be attributed to heat failure of the insulation. Due to arcing-through-char discovered later in the examination of circuits that were fed from the panel, the failure was determined to have been caused by the external attack by fire upon an energized circuit, not fire causation. Although caused by an external attack by fire, the presence of arc melted and severed conductors are useful in evaluating fire progression and determining areas first attacked by the fire.
50. A clothes washer was located immediately in front of the basement electrical panel. The washing machine exhibited burning and oxidation patterns that were consistent with exposure to a fire in front of the appliance. The motor and electrical components suffered varying degrees of damage due to their proximate location to the fire. There was no evidence of arcing, shorting or failure of the washing machine that could have caused the fire. All damage observed was consistent with an external attack by fire. A portion of stranded copper conductors was recovered from the top surface of the washing machine. The conductor size and wire count was consistent with a 16 AWG, orange extension cord that was related as having been plugged into the receptacle above the washing machine. The conductors were arc melted with discrete molten beads of copper and partial severing of the conductor. The damage was remote from attachment plug connections and there was no evidence of pinch-points to account for mechanical damage to the cord. The damage was consistent with arcing-

through-char that occurred as the fire attacked the energized cord. The cord was routed from the receptacle, along the interior of the west basement utility room wall, under the basement door. It supplied a sump pump that was installed directly outside of the basement door in a sump. The presence of arcing-through-char near the receptacle indicates the fire progression was from the east to the west of the basement utility room and along the south side. There was no evidence of arcing, shorting, failure of the sump pump or the extension cord, other than described, that could have caused the fire.

51. Lighting in the basement was reportedly accomplished by a ceiling-mounted dual bulb incandescent fixture that had a single bulb installed. The fixture remains were recovered from the debris and examined. The fixture employed two medium base ceramic lamp holders. The supply connections were intact. The screwshells were melted and no remains of the bulb were located. There was no evidence of arcing, shorting or failure that could have caused the fire.
52. A water heater was located in the basement utility room to the east of the washing machine. The metal enclosure was burned and oxidized on the exterior. The oxidation extended to the floor in the front portion of the water heater as defined by the location of the thermostats and heater mounts. The access covers were located in the debris in front of the water heater. The covers were stacked on each other and on the floor. Examination of the screw holes in the cover plates and the water heater enclosure revealed no evidence of forced extraction of the screws. This is consistent with the covers not being in place during the fire. The supply wiring connections in the upper portion of the enclosure were intact. Insulation was burned from the conductors exposing the solid copper conductors. Examination of the wiring from the supply connections back to the electrical distribution panel revealed no evidence of arcing or shorting. The upper thermostat, Calrod® heater and associated connections were intact with no evidence of arcing, shorting or failure. One conductor leading to the lower thermostat was arc-severed a few inches above the lower thermostat. The lower thermostat had two screw terminals on the left side that exhibited very different damage from each other. The lower screw terminal was partially oxidized but otherwise intact. The upper screw terminal was severely oxidized and partially melted. Molten copper was observed around the screw threads under the screw head. The two terminals were within one inch of each other. The presence of melted screw head and copper conductor on one screw terminal and the absence of similar damage to the adjacent screw terminal, indicates a loose terminal connection failure with arc damage sufficient to melt the screw and copper conductor. The arc event would have discharged molten particles of the brass screw and the copper conductor. These molten particles would have been capable of igniting combustible material in close proximity to the lower thermostat. Additionally, the arcing of the supply conductor above the lower thermostat indicated the power to the branch circuit was still energized following the terminal failure. The absence of any additional arcing on the branch circuit wiring indicates this event occurred in the early stages of the fire progression through the basement utility room.

EVIDENCE COLLECTED:

53. Electric meter base
54. Electric water heater
55. The fire scene was photographed with an SLR camera by members of the Baltimore City Police Department (Crime Scene Unit).

FIRE PROGRESSION TO OTHER STRUCTURES:

56. The adjacent residence at 512 S. Macon Street received smoke and fire damage.

CONCLUSION:

Based upon the fire scene examination and information obtained by investigators to date, it was determined that the fire originated within the rear of the basement at 514 S. Macon Street and then spread to the first and second floors. The fire rapidly involved the structure due to combustible wall surfaces, numerous voids spaces and opening in the ceilings. Furthermore, it is believed the fire was caused by an electrical failure at the lower thermostat in the basement water heater. This failure resulted in the discharge of hot metal fragments onto adjacent combustible materials causing the ignition of these materials. This fire is classified as accidental at this time.

NUMBER OF FATALITIES AND/OR INJURIES:

Fire Service Personnel

- FF Allen Roberts – Deceased
- FPA Brandon Maddox – Burns
- FPA James Butler - Burns

Occupants

- Linda Propst –Smoke inhalation
- William Preller – Burns, fall injuries

ESTIMATED VALUE OF LOSS:

58. \$200,000.00

MISCELLANEOUS:

59. On October 10, 2006, at approximately 1:54 a.m., the weather station at the Baltimore Washington International Airport (BWI) reported the below listed conditions.

Temperature: 57.9° F
Wind: Calm
Humidity: 90%
Sky: Clear

The weather conditions did not contribute to the ignition or spread of this fire.

Appendix C

Reports from Baltimore City Safety Office

Baltimore City Fire Department
Safety and Health Office
Macon Street Report

The Safety and Health Office headed by the Chief Safety officer is responsible for directing or assisting in the investigating of line of duty injuries and deaths of Department personnel. Fire Fighter Allan Roberts' death was an extremely emotional and grief filled experience for the men and women of our Department, particularly members on location. In spite of their grief, they were composed and assisted investigators in trying to determine the events leading up to the tragedy. The Safety Office has been part of the investigation from the very beginning and will continue to assist as needed. The following is a chronicle representing the activities of the Safety Office investigating the death of FF. Allan Roberts.

On the morning of October 10, 2006, I received notification of several members seriously injured while fighting a dwelling fire located at 514 S. Macon Street. Once I arrived on the scene, I received a briefing by the on scene Incident Safety Officer, Lieutenant John Boblits. All three injured fire fighters had been transported to medical facilities with one member reported to be in cardiac arrest.

At this point the role of the Safety Office was to secure all affected equipment, and begin interviewing on scene members. Safety's immediate objective was to capture as much information from members involved while thoughts and observations were vivid. The Incident Commander, Mr. Reese Wingate, Battalion Chief 1, assisted in identifying equipment worn by the injured members. Recovered at the scene in front of 516 S. Macon Street was the personal protective equipment including SCBA's worn by FPA James R. Butler, Squad 11 and FPA Brandon C. Mattox, Engine Co 23.

The Self Contained Breathing Apparatus worn by FF. Allan Roberts, E41 had been removed from his then unconscious body and placed in the compartment of Truck 20, which was positioned in front of the fire building. Other personal protective gear worn by FF Roberts was retrieved from Bayview Medical Center. Each member's complete protective ensemble was separately bagged and secured temporarily in the vehicle of Safety Officer 2. Later that day, the equipment was transported to Old Town Station, 1100 Hillen Street and secured in lockers.

At 0630 hours, Lieutenant Michael Savino, the day shift Safety Officer 2 was ordered to the scene to assist with scene safety, photos, evidence collection and interviews. The Office of Occupational Safety for Baltimore City was notified of the tragedy and immediately reported the incident to Maryland Occupational Safety and Health. At approximately 1030 hours, Mr. Robert Fadrowski of MOSH arrived on location to survey the scene. During his inspection, I provided Mr. Fadrowski with an update on the medical conditions of FPA Butler and FPA Mattox.

In addition to on scene interviews, all members on the alarm assignment were instructed to complete a special report immediately on their return to quarters. The special reports were to detail each member's activity while operating on the

Macon Street incident. As on scene interviews were concluding, I reported to Bayview Hospital to conduct interviews with FPA Mattox and FPA Butler. I spoke briefly with FPA Mattox, who was heavily sedated and learned FPA Butler had been released and transported to our Public Service Infirmary (PSI). I interviewed FPA Butler on his return to quarters at the station of Squad 11.

The National Institute of Occupational Safety and Health (NIOSH) was contacted to report the death of FF Allan Roberts and to schedule a date for their visit to Baltimore to begin their investigation. On my return to the office I spoke with representatives from their West Virginia office. Due to earlier commitments, the date for NIOSH's visit in Baltimore could not be confirmed during the conversation. We agreed to talk again the next day.

On the Morning of October 11, 2006, I gave a briefing to Chief Safety Officer, Ms Susan Schuder, of Baltimore City.-Office of Occupational Safety. She advised all notifications had been made and that Mr. Meir Goldman, legal counsel, would be representing the interest of the City.

I was unable to interview FPA Mattox due to his condition and considerations for family members at his bed side, I ordered Lieutenant Kyle Caldwell, Safety Officer 4, to Bayview Hospital the following day to conduct an interview with the injured member.

As agreed on October 10, 2006, Safety Officer staff members along with MOSH investigators met at Old Town Station on October 12, 2006 to photograph and inventory the personal protective gear including SCBA's worn by FF. Roberts, FPA Butler and FPA Mattox. The meeting concluded at 1330 hours. In attendance during the inspections were:

Mr. Robert Fadrowski, MOSH
Mr. William H. Jones, Jr., CSO

Michael Savino, Safety Officer 2
Kyle Caldwell, Safety Officer 4

On October 12, 2006 I met with NIOSH official at the S. Macon Street location along with MOSH officials to assist in the initial stage of NIOSH investigation. Once completing their on scene examination, the group traveled to Old Town Station to photograph and examine the equipment of the injured members. The Group included

Mr. Robert Fadrowski, MOSH
Mr. Matt Bowyer, NIOSH
Mr. Steve Berardinelli, NIOSH

Mr. William H. Jones, Jr., CSO
Kyle Caldwell, Safety Officer 4

October 16, 2006 follow up interviews were conducted at the Station of Engine 5 and Squad 11 with key members on the scene during the tragedy.

On October 20, 2006 at 0930 hours and at the request of the Chief Safety Officer, representatives from Lion Apparel visited Baltimore to inspect the personal protective gear worn by the injured fire fighters. Maryland Occupational Safety and Health Representatives were present. Representing the City of Baltimore and the Office of Occupational Safety was attorney, Mr. Meir Goldman. He

advised all parties present that he would be the point of contact for collecting and forwarding documents to the various agencies involved in the investigation of FF Roberts' death. Attending this meeting and inspection were

Mr. Robert Fadrowski, MOSH
Karen E. Lehtonen, Lion Apparel
Mark Staten, Sr., Lion Apparel
Mr. Meir Goldman, OOS-Balto. City

Mr. William H. Jones, Jr., CSO
William Kern, Safety Officer 2
Kyle Caldwell, Safety Officer 4

The self contained breathing apparatus worn by FF. Roberts was shipped on October 23, 2006 to NIOSH-National Personal Protective Technology Lab located in Pittsburgh, PA. The shipment was addressed to the attention of Mr. Vance Kochenderfer at the Technology Evaluation Branch.

Received notification from Deputy Chief, Mr. Theodore G. Saunders that he would be heading the investigation and appointing a committee to examine the tragedy of October 10, 2006. The Chief Safety Officer would be a member of the committee.

On November 15, 2006, NIOSH officials returned to Baltimore to conduct interviews with members operating on S. Macon Street. The Safety Office assisted the Office of the Fire Marshal in facilitating the interviews. Joining the interview panel was officials from MOSH.

December 7, 2006 attended Macon Street Reconstruction Committee meeting held at Headquarters.

January 9, 2006 Safety in conjunction with Operations authorized the production and distribution of door wedges. The wedges will be standard issued equipment.

January 19, 2007 along with Safety Officer 4, Lieutenant Kyle Cladwell and members of the Committee participated in re-enactments of Macon Street tragedy at the Alcohol, Tobacco, and Firearms laboratory in Beltsville, MD.

Received a preliminary evaluation report on April 2, 2006 of the SCBA worn by FF Roberts from Mr. Kochenderfer of NIOSH Laboratory in Pittsburgh. The report was forwarded to Chief Saunders for review and distribution to committee members.

NIOSH Laboratory shipped the SCBA worn by FF. Roberts back to Baltimore. The equipment was returned to Old Town Station and secured. After reviewing the report, a number of questions regarding the functionality of SCBA were unanswered. On April 25, 2007 the SCBA was taken to the Air Mask Repair facility at the Academy and ran through several diagnostic tests by FF Chester Andrzejewski. A lengthy discussion ensued among Committee members in attendance.

Appendix D

NIOSH Evaluation of SCBA

NIOSH Reference: TN-14886

Phone: (412) 386-4000

Fax: (412) 386-4051

August 10, 2007

Chief William Jones
Baltimore City Fire Department
401 East Fayette Street, LL1
Baltimore, Maryland 21202

Dear Chief Jones:

The National Institute for Occupational Safety and Health (NIOSH) has concluded its investigation conducted under NIOSH task number 14886. This investigation consisted of the inspection and testing of one Dräger Safety 4500 psi, 45-minute, self-contained breathing apparatus (SCBA) submitted by the Baltimore City Fire Department. The SCBA, sealed in a corrugated cardboard box, was delivered to the NIOSH facility in Bruceton, Pennsylvania on October 30, 2006. The sealed package was taken to the Firefighter SCBA Evaluation Lab (building 108) and stored under lock until the time of the evaluation.

SCBA Inspection

The package from the Baltimore City Fire Department was opened and the SCBA inspection was initiated on March 6, 2007. The SCBA was examined, component by component, in the condition as received to determine its conformance to the NIOSH-approved configuration. The visual inspection process was videotaped. The SCBA was identified as the Dräger AirBoss Evolution model.

The complete SCBA inspection is summarized in Appendix I of the enclosed Status Investigation Report. The condition of each major component was also photographed with a digital camera. Images of the SCBA are contained in Appendix IV of the report.

Although the SCBA showed signs of extensive use and wear, it was determined that it could be safely pressurized and tested. The interior of the demand valve outlet was very dirty, suggesting the demand valve was detached from the facepiece in a smoky environment. There are a few signs of heat damage on the cylinder retention band, shoulder straps, and cylinder valve. The cylinder bears some scrapes which may render it unfit for use; it should be examined by a qualified retester before being returned to service. The damage to the cylinder valve is such that it should be repaired or replaced.

SCBA Compressed Air Cylinder Contents

During the inspection it was noted that the compressed air cylinder was partially pressurized. An air sample was collected from the cylinder and forwarded to a laboratory for analysis. The laboratory, Lab Services-ITR, analyzed the sample in accordance with the standards and methodologies found in the Compressed Gas Association's standard, ANSI/CGA G-7.1, *Commodity Specification for Air*. The analysis is attached as Appendix II of the Status Investigation Report.

The test report indicates that the sample met the standard for Grade D air. The sample also met OSHA's moisture content requirement in 29 CFR 1910.134(i)(4)(iii) as well as the more stringent moisture content guidelines published in NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, 2002 Edition.

SCBA Testing

The purpose of the testing was to determine the SCBA's conformance to the approval performance requirements of Title 42, *Code of Federal Regulations*, Part 84 (42 CFR 84). Further testing was conducted to provide an indication of the SCBA's conformance to the National Fire Protection Association (NFPA) Air Flow Performance requirements of NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus for the Fire Service*, 1997 Edition.

The following performance tests were conducted on the SCBA:

NIOSH SCBA Certification Tests (in accordance with the requirements of 42 CFR 84):

1. Positive Pressure Test [§ 84.70(a)(2)(ii)]
2. Rated Service Time Test (duration) [§ 84.95]
3. Static Pressure Test [§ 84.91(d)]
4. Gas Flow Test [§ 84.93]
5. Exhalation Resistance Test [§ 84.91(c)]
6. Remaining Service Life Indicator Test (low-air alarm) [§ 84.83(f)]

National Fire Protection Association (NFPA) Tests (in accordance with NFPA 1981, 1997 Edition):

7. Air Flow Performance Test [Chapter 5, 5-1.1]

The NIOSH tests were performed on March 7, 2007. Although the SCBA was not labeled as compliant with NFPA 1981, it was requested that the NFPA Air Flow Performance Test be performed and this was conducted on March 23, 2007. All testing was videotaped with the exception of the Exhalation Resistance Tests and Static Pressure Tests.

The SCBA ran out of air before its rated service time, causing the unit to fail the Rated Service Time Test and Positive Pressure Test. It also had excessive exhalation resistance during the

NFPA Air Flow Performance Test. A rattling noise was observed coming from the facepiece exhalation valve; it is possible that improper function of this valve could cause the failing test results. The unit met the requirements of all other tests. While the unit was capable of supplying air to the user, it was unable to provide the designed level of protection.

Appendix III of the Status Investigation Report contains the complete NIOSH and NFPA test reports for the SCBA. Tables One and Two summarize the test results.

Summary and Conclusions

The SCBA submitted to NIOSH by the Baltimore City Fire Department for evaluation was delivered to NIOSH on October 30, 2006 and inspected on March 6, 2007. The unit was identified as a Dräger AirBoss Evolution 45-minute, 4500 psi SCBA (NIOSH approval number TC-13F-379). The unit was determined to be in a condition safe for testing.

The unit was subjected to a series of seven performance tests. Testing was performed on March 7 and 23, 2007. The SCBA was able to meet the requirements of all tests except the Rated Service Time Test, Positive Pressure Test, and NFPA Air Flow Performance Test. No maintenance or repair work was performed on the unit at any time.

Following inspection and testing, the SCBA was returned to the package in which it was received and was shipped back to the Baltimore City Fire Department on April 5, 2007.

If the SCBA is to be placed back in service, it must be thoroughly inspected, repaired, and tested by a qualified service technician. The cylinder should be inspected by a certified retester before being put back into use, and the cylinder valve repaired or replaced.

In light of the information obtained during this investigation, NIOSH has proposed no further action on its part at this time. The investigation under task number 14886 will be considered closed. If you have any questions or require additional information, please contact me at 412-386-4029.

Sincerely yours,

Vance Kochenderfer
Quality Assurance Specialist
Technology Evaluation Branch
National Personal Protective Technology Laboratory

Enclosure

cc: M. Bowyer, NIOSH Division of Safety Research
A. Donaldson, Dräger Safety UK Limited

NIOSH:NPPTL:TECHNOLOGY EVALUATION BRANCH:KOCHENDERFER:

Spelling Verified by:

bcc:

file TN-14886

V. Kochenderfer

Branch Reading file

Concur:

CPIP Coordinator, TEB _____

Branch Chief, TEB _____

Address for A. Donaldson:

Angus Donaldson

Dräger Safety UK Limited

Ullswater Close

Blyth Riverside Business Park

Blyth, Northumberland, NE24 4RG

GREAT BRITAIN



National Personal Protective Technology Laboratory

Technology Evaluation Branch

Status Investigation Report of One
Self-Contained Breathing Apparatus
Submitted by the
Baltimore City Fire Department
Baltimore, Maryland

NIOSH Task No. 14886

August 7, 2007

Disclaimer

The purpose of Respirator Status Investigations is to determine the conformance of each respirator to the NIOSH approval requirements found in Title 42, *Code of Federal Regulations*, Part 84. A number of performance tests are selected from the complete list of Part 84 requirements and each respirator is tested in its **"as received"** condition to determine its conformance to those performance requirements. Each respirator is also inspected to determine its conformance to the quality assurance documentation on file at NIOSH.

In order to gain additional information about its overall performance, each respirator may also be subjected to other recognized test parameters, such as National Fire Protection Association (NFPA) consensus standards. While the test results give an indication of the respirator's conformance to the NFPA approval requirements, NIOSH does not actively correlate the test results from its NFPA test equipment with those of certification organizations which list NFPA-compliant products. Thus, the NFPA test results are provided for information purposes only.

Selected tests are conducted only after it has been determined that each respirator is in a condition that is safe to be pressurized, handled, and tested. Respirators whose condition has deteriorated to the point where the health and safety of NIOSH personnel and/or property is at risk will not be tested.

Investigator Information

The SCBA inspections and performance tests were conducted by and this report was written by Vance Kochenderfer, Quality Assurance Specialist, Technology Evaluation Branch, National Personal Protective Technology Laboratory, National Institute for Occupational Safety and Health, located in Bruceton, Pennsylvania.

**Status Investigation Report of One
Self-Contained Breathing Apparatus
Submitted by the
Baltimore City Fire Department
Baltimore, Maryland**

NIOSH Task No. 14886

Background

As part of the *National Institute for Occupational Safety and Health (NIOSH) Fire Fighter Fatality Investigation and Prevention Program*, the Technology Evaluation Branch agreed to examine and evaluate one Dräger Safety 4500 psi, 45-minute, self-contained breathing apparatus (SCBA).

This SCBA status investigation was assigned NIOSH task number 14886. The Baltimore City Fire Department was advised that NIOSH would provide a written report of the inspections and any applicable test results.

The SCBA, sealed in a corrugated cardboard box, was delivered to the NIOSH facility in Bruceton, Pennsylvania on October 30, 2006. The sealed package was taken to the Firefighter SCBA Evaluation Lab (building 108) and stored under lock until the time of the evaluation.

SCBA Inspection

The package from the Baltimore City Fire Department was opened and the SCBA inspection was initiated on March 6, 2007. A complete visual inspection of the SCBA was completed on that day by Vance Kochenderfer, Quality Assurance Specialist, of the Technology Evaluation Branch, National Personal Protective Technology Laboratory (NPPTL), NIOSH. The SCBA was examined, component by component, in the condition as received to determine its conformance to the NIOSH-approved configuration. The visual inspection process was videotaped. The SCBA was identified as the Dräger AirBoss Evolution model.

The complete SCBA inspection is summarized in **Appendix I**. The condition of each major component was also photographed with a digital camera. Images of the SCBA are contained in **Appendix IV**.

Although the SCBA showed signs of extensive use and wear, it was determined that it could be safely pressurized and tested. The interior of the demand valve outlet was very dirty, suggesting the demand valve was detached from the facepiece in a smoky environment. There are a few signs of heat damage on the cylinder retention band, shoulder straps, and cylinder valve. The cylinder bears some scrapes which may render it unfit for use; it should be examined by a qualified retester

before being returned to service. The damage to the cylinder valve is such that it should be repaired or replaced.

SCBA Compressed Air Cylinder Contents

During the inspection it was noted that the compressed air cylinder was partially pressurized. An air sample was collected from the cylinder and forwarded to a laboratory for analysis. The laboratory, Lab Services-ITR, analyzed the sample in accordance with the standards and methodologies found in the Compressed Gas Association's standard, ANSI/CGA G-7.1, *Commodity Specification for Air*. The analysis is attached as **Appendix II**.

The test report indicates that the sample met the standard for Grade D air. The sample also met OSHA's moisture content requirement in 29 CFR 1910.134(i)(4)(iii) as well as the more stringent moisture content guidelines published in NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, 2002 Edition.

SCBA Testing

The purpose of the testing was to determine the SCBA's conformance to the approval performance requirements of Title 42, *Code of Federal Regulations*, Part 84 (42 CFR 84). Further testing was conducted to provide an indication of the SCBA's conformance to the National Fire Protection Association (NFPA) Air Flow Performance requirements of NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus for the Fire Service*, 1997 Edition.

The following performance tests were conducted on the SCBA:

NIOSH SCBA Certification Tests (in accordance with the requirements of 42 CFR 84):

1. Positive Pressure Test [§ 84.70(a)(2)(ii)]
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4. Gas Flow Test [§ 84.93]
5. Exhalation Resistance Test [§ 84.91(c)]
6. Remaining Service Life Indicator Test (low-air alarm) [§ 84.83(f)]

National Fire Protection Association (NFPA) Tests (in accordance with NFPA 1981, 1997 Edition):

7. Air Flow Performance Test [Chapter 5, 5-1.1]

The NIOSH tests were performed on March 7, 2007. Although the SCBA was not labeled as compliant with NFPA 1981, it was requested that the NFPA Air Flow Performance Test be performed and this was conducted on March 23, 2007. All testing was videotaped with the exception of the Exhalation Resistance Tests and Static Pressure Tests.

The SCBA ran out of air before its rated service time, causing the unit to fail the Rated Service Time Test and Positive Pressure Test. It also had excessive exhalation resistance during the NFPA Air Flow Performance Test. A rattling noise was observed coming from the facepiece exhalation valve; it is possible that improper function of this valve could cause the failing test results. The unit met the requirements of all other tests. While the unit was capable of supplying air to the user, it was unable to provide the designed level of protection.

Appendix III contains the complete NIOSH and NFPA test reports for the SCBA. **Tables One and Two** summarize the test results.

Summary and Conclusions

The SCBA submitted to NIOSH by the Baltimore City Fire Department for evaluation was delivered to NIOSH on October 30, 2006 and inspected on March 6, 2007. The unit was identified as a Dräger AirBoss Evolution 45-minute, 4500 psi SCBA (NIOSH approval number TC-13F-379). The unit was determined to be in a condition safe for testing.

The unit was subjected to a series of seven performance tests. Testing was performed on March 7 and 23, 2007. The SCBA was able to meet the requirements of all tests except the Rated Service Time Test, Positive Pressure Test, and NFPA Air Flow Performance Test. No maintenance or repair work was performed on the unit at any time.

In light of the information obtained during this investigation, NIOSH has proposed no further action on its part at this time. Following inspection and testing, the SCBA was returned to the package in which it was received and was shipped back to the Baltimore City Fire Department on April 5, 2007.

If the SCBA is to be placed back in service, it must be thoroughly inspected, repaired, and tested by a qualified service technician. The cylinder should be inspected by a certified retester before being put back into use, and the cylinder valve repaired or replaced.

Appendix I

SCBA Inspection Report



National Personal Protective Technology Laboratory / Technology Evaluation Branch

Respirator Field Problem
Incoming Inspection Report Summary

Task Number: 14886	Requestor: Baltimore City Fire Department
Date Received: 30 October 2006	
Date Inspected: 6 March 2007	Description: Fatality
Manufacturer: Dräger	Inspected by: Vance Kochenderfer
Approval Number: TC-13F-379	SCBA Type: Open Circuit, Pressure-Demand

As received, the SCBA was packaged in a corrugated cardboard box (refer to **Figure 1** in **Appendix IV**). The unit was contained in a carrying bag; a tag attached to the bag's handle is marked "**Roberts**" (refer to **Figures 2 and 3**).

Components and Observations

NOTE: All references to "right" or "left" are from the user's perspective.

1. Facepiece (Refer to Figures 4 through 6 in Appendix IV):

The facepiece appears to be a Dräger Panorama Nova facepiece assembly which consists of a rubber facepiece seal, lens, lens clamp, and rubber head harness. Overall the facepiece is in good to very good condition. The exterior of the facepiece lens has many scratches and is very sooty. The interior of the lens is also dirty, but has only a few scratches. Visibility through the lens is fair to poor.

The metal lens clamp holds the lens to the facesal. The clamp is secure and the two screws holding the clamp halves together appear to be fully tightened. The clamp has some scratches and dents.

The assembly that houses the demand valve port, speech diaphragm, and exhalation valve sub-assemblies appears undamaged. The metal screen of the exhalation valve cover is slightly dented. The exhalation valve appears to be properly seated. A speech diaphragm is installed and appears normal. The demand valve can be easily attached to and removed from the housing. The clamp holding the housing to the facesal is secure.

The black rubber facepiece seal is in very good condition. All five head harness attachment points are secure. There are no cuts, deformities, or any signs of damage to the seal. The text "**4052955**" and "**ARHK-0593**" is molded into the lower left attachment point. Molded into the right cheek area on the facesal exterior is a Dräger logo and "**PANORAMA NOVA**"; the

interior has a circular date code indicating the seal was molded in the **first half of 1994** as well as "**R53066.**"

There is a black rubber nose cup assembly installed in the facepiece. The nose cup is partially dislodged from the retaining groove intended to hold it in place. The two inhalation valves installed in the nose cup are undamaged. Molded on the nose cup interior on the right side is a circular date code indicating it was molded in the **first half of 1995** along with the designation "**R53237.**"

The black rubber head harness is in good to very good condition. All five straps can be easily adjusted. The straps appear to be slightly deteriorated. When stretched, small cracks appear in the material, but it does not tear or break. Molded into the back of the head harness is a circular date code indicating it was molded in the **first half of 1994** and the designation "**R26279.**" A yellow webbing neck strap is attached to the facepiece. While it is very dirty, it has no cuts or tears.

2. **Demand Valve and Hose** (Refer to Figures 7 through 9 in Appendix IV):

The facepiece-mounted demand valve assembly is dirty but is in very good to excellent condition. There is a cut approximately ¼ inch long in the rubber cover near the donning switch. The serial number "**BRRB-0295**" is engraved into the plastic housing. The bypass valve on the right side is in the fully closed position and operates smoothly. The donning switch is not engaged, and it can be set and released properly. The o-ring seal is intact but somewhat dirty. There is a great deal of sooty material coating the components in the regulator outlet. The hose swivels freely where it connects to the demand valve.

The demand valve hose is undamaged. The rubber jacket has "**Draeger R21034 11/00**" molded into it. It is routed through the left shoulder strap down along the left side of the backframe and is securely fastened at the pressure reducer. The hose is free to turn at the pressure reducer connection. A keyring is attached to the hose where it connects to the reducer; a metal tag reading "**E-41**" is attached to the ring.

3. **Air Pressure Reducer and Buddy Breather Connection** (Refer to Figures 10 through 12 in Appendix IV):

The pressure reducer appears to be in very good condition. The exterior of the metal housing has a mottled appearance from soot and dirt but is undamaged. The reducer is securely fastened to the backframe. The cylinder connector nut and handwheel are undamaged. The cylinder sealing nipple and o-ring are intact.

The buddy breather connection is securely fastened to the pressure reducer. The hose jacket has no cuts or tears and is marked "**Draeger R21034 12/03.**" The hose extends along the left side of the waistbelt and ends in a female quick-disconnect fitting protected by a rubber dust cap. The coupling appears to be undamaged and the interior is clean. A fabric pouch attached

to the right side of the backframe contains the buddy breather extension hose. The hose jacket is undamaged, and the male quick-disconnect couplings on both ends properly connect with the female coupling.

4. **Remote Air Pressure Gauge and Whistle** (Refer to Figures 13 and 14 in Appendix IV):

This SCBA is equipped with a remote air pressure gauge and a low-air alarm whistle. The gauge body is covered with a protective rubber boot. Visibility through the gauge lens is good and it currently reads empty.

The whistle outlet is somewhat sooty, but the opening is not blocked. The gauge hose is undamaged and marked "**Draeger R21034 04/04**" along its length. It is routed through the right shoulder strap and securely fastened to the pressure reducer. This connection swivels easily.

5. **Backframe and Harness Assembly** (Refer to Figures 15 through 17 in Appendix IV):

The backframe body is made of molded plastic. It is very dirty but has no cracks or other signs of damage. The cylinder retention band operates properly. While the webbing of the retention band is undamaged, exposed portions of the Velcro are melted. Affixed to the back of the backframe is a NIOSH approval label, which is obscured by soot and a piece of tape. At the lower left near the waistbelt is a Dräger label marked with the part number **3351264** and the serial number **BRUE-2242**. The same serial number has been hand-engraved into the lower right of the backframe.

The front side of the backframe is much cleaner. A red "**AIRBOSS EVOLUTION**" label is affixed to the front bearing a legend indicating that the SCBA was designed to meet some unspecified fire service standard. This label is marked with the serial number "**BRUE-2242**" and the space for the part number is empty.

Both shoulder straps are securely fastened at the top of the backframe. Some webbing components of the shoulder straps appear to be heat damaged. Otherwise, they have no cuts or tears. The fabric components are undamaged. There is a small piece of molten plastic adhering to the left shoulder strap. Both adjustment buckles work properly and the adjustment straps are securely attached to the waistbelt at the bottom.

The waistbelt is securely fastened to the backframe. The fabric and webbing components do not appear damaged. A regulator storage point is attached to the right side of the waistbelt. The waistbelt buckle and both adjustment mechanisms function properly.

6. **Compressed Air Cylinder** (Refer to Figures 18 through 26 in Appendix IV):

The cylinder is fully wound with composite reinforcement. The exterior is very dirty but the cylinder does not appear to be fire-damaged. There are some scratches on the exterior; a few

of these appear to have penetrated into the composite layer and so the cylinder should be examined by a qualified retester before being returned to use. The cylinder is rated for a pressure of **4500 psi** and was manufactured by EFIC under Department of Transportation (DOT) exemption **E 10147**. The DOT label indicates that the cylinder is Dräger part number "**4054748**" and was produced in **May 1997**. The serial number and much of the rest of the label are obscured by soot. A hydrostatic retest label on the shoulder indicates the cylinder was retested in **June 2005** by the retester holding the ID number **A264**. As received, the cylinder valve handwheel was fully closed and the cylinder outlet was fully tightened to the pressure reducer connection.

The cylinder valve assembly is in fair to poor condition. The pressure gauge lens is somewhat melted; the gauge cannot be seen on the back side of the valve, and visibility is very poor on the front side. The gauge appears to read approximately 1800 psi. The valve handwheel is of the non-locking type and operates smoothly. The valve stem is bent so that the handwheel is cocked at an angle. A burst disc assembly is installed in the valve. The rubber end bumper exhibits some heat damage but remains securely fastened to the valve. The valve outlet threads appear undamaged, although they have some white superficial corrosion.

Appendix II

Air Analysis Results

Zephyr-Air™ Test Report

Sample Report for Breathing Air Analysis

Sample Information: NIOSH/NPPTL/Ref. TN-14886

Customer Name:		Mr. Vance Kochenderfer				Sample Collection Date:		03/06/2007	
Customer ID#		7001				Sample Analysis Date:		03/15/2007	
Standard Type		ANSI/CGA 7.1-1997				Standard Grade		D	
Gas Sample ID#		11282				Gas Sample Particulate#		8118	
Analytes	O ₂ %	CO (ppm)	CO ₂ (ppm)	Ar %	CH ₄ (ppm)	Odor	Oil mist (mg/m ³)	Moisture (dewpoint F)*	Result
Sample Analysis	20.9	<1.0	401	0.7	2.4	None	<0.1	-66.4	PASS

***SCBA Only**

Summary:

This breathing air sample supplied by the above named customer was analyzed by Lab Services-ITR, using gas chromatography, calorimetric and gravimetric analysis in accordance with the standards and methodologies found in ANSI/CGA 7.1, "Commodity Specification for Air." No other representations or warranties are expressed or implied other than the analysis results shown above.

Performed by: W. P. Neen
Lab Technician

Reviewed by: George Hall
Director-Chemistry & QC or (delegate)

****NOTE**** This sample which contained an air/gas substance was tested ONLY against a specific air standard, and may contain undetected items which are beyond the purpose and scope of this analysis. More extensive reporting can be conducted upon request. This does not guarantee the condition or the safe application of the analyzed air/gas substance. Results reported relate only to the items tested above. This report shall not be reproduced except in full, without the expressed written consent of Lab Services-ITR.

Appendix III

SCBA Test Results



National Personal Protective Technology Laboratory / Technology Evaluation Branch

SCBA Test Report

Task Number: 14886
Manufacturer: Dräger Safety
NIOSH Approval Number: TC-13F-379
Tests Performed by: Vance Kochenderfer
Date of Report: August 7, 2007

I. Background

On October 30, 2006, a package from the Baltimore City Fire Department was delivered to NIOSH. The package was taken to the Firefighter Self-Contained Breathing Apparatus (SCBA) Evaluation Lab (building 108) for secured storage. The SCBA was removed from its box and inspected on March 6, 2007. The SCBA inspection process was videotaped. It was determined that the SCBA was manufactured by Dräger Safety under NIOSH approval number TC-13F-379. It was found to be in a condition where it could be safely pressurized and tested. A series of performance tests was conducted on March 7, 2007. Although the SCBA was not labeled as compliant with NFPA 1981, it was requested that the NFPA Air Flow Performance Test be performed and this was conducted on March 23, 2007. All performance tests, with the exception of the Exhalation Resistance Test and Static Pressure Test, were videotaped. The Positive Pressure Test and Rated Service Time Test are conducted simultaneously.

II. Test Outlines

A. POSITIVE PRESSURE TEST – NIOSH Test Procedure No. 120

42 CFR Part 84 Reference: Subpart H, § 84.70 (a)(2)(ii)

Requirement:

The pressure inside the facepiece in relation to the immediate environment is positive during both inhalation and exhalation.

Procedure:

A breathing machine with a 622 kg.-m./min. cam operating at 24 RPM with a 40-liter per minute flow rate (115 liters per minute peak flow) is connected to an anthropometric head for cycling. A pressure tap in the head is connected to a transducer which in turn is connected to a strip chart recorder for determining the pressure in the facepiece.

Results – Tested on March 7, 2007, with SCBA in as-received condition.

The cylinder was exhausted before the rated service time was reached, causing the inhalation portion of the breathing curve to drop below ambient. Prior to cylinder exhaustion, the inhalation pressure was approximately -0.30 INWC. The SCBA **did not** meet the test requirement.

Inhalation Breathing Resistance:	n/a	INWC
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B. RATED SERVICE TIME TEST – NIOSH Test Procedure No. 121

42 CFR Part 84 Reference: Subpart F, § 84.53 (a) and Subpart H, § 84.95 (a) and (b)

Requirement:

Service time will be measured while the apparatus is operated by a breathing machine as described in § 84.88. The open-circuit apparatus will be classified according to the length of time it supplies air or oxygen to the breathing machine. Classifications are listed in § 84.53.

Procedure:

A breathing machine with a 622 kg.-m./min. cam operating at 24 RPM with a 40 liters per minute flow rate is connected to an anthropometric head for cycling. A pressure tap in the head is connected to a transducer which in turn is connected to a strip chart recorder for determining the pressure in the facepiece. The breathing machine is run until the inhalation portion of the breathing curve falls below the minimum requirement.

Results – Tested on March 7, 2007, with SCBA in as-received condition.

The measured service time (adjusted to correspond with the recorded breathing cycles) was less than the rated service time of 45 minutes. The SCBA **did not** meet the test requirement.

Measured Service Time:	37	Minutes	40	Seconds
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C. STATIC PRESSURE TEST – NIOSH Test Procedure No. 122

42 CFR Part 84 Reference: Subpart H, § 84.91 (d)

Requirement:

The static pressure (at zero flow) in the facepiece shall not exceed 38 mm. (1.5 inches) water-column height.

Procedure:

The facepiece is fitted to an anthropometric head for testing. A pressure tap in the head is connected to a calibrated manometer. Full cylinder pressure is applied to the unit at zero flow and a reading from the manometer is recorded.

Results – Tested on March 7, 2007, with SCBA in as-received condition.

The SCBA met the NIOSH requirement for static facepiece pressure.

Facepiece Static Pressure:	0.90	INWC
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D. GAS FLOW TEST – NIOSH Test Procedure No. 123

42 CFR Part 84 Reference: Subpart H, § 84.93 (b) and (c)

Requirement:

The flow from the apparatus shall be greater than 200 liters per minute when the pressure in the facepiece of demand apparatus is lowered by 51 mm. (2 inches) water column height when full container pressure is applied. Where pressure demand apparatus are tested, the flow will be measured at zero gage pressure in the facepiece.

Procedure:

A pressure tap in the anthropometric head is connected to a manometer for determining when the pressure inside the facepiece is at zero. A mass flow meter is connected in line between the anthropometric head and an adjustable vacuum source to measure flow. The SCBA cylinder is replaced by a test stand which is adjusted initially to full cylinder pressure. The vacuum source is adjusted during the test to maintain the desired pressure inside the facepiece. Once the proper facepiece pressure has stabilized, a flow reading is recorded. The procedure is then repeated with the test stand adjusted to 500 psig.

Results – Tested on March 7, 2007, with SCBA in as-received condition.

The SCBA achieved the required flow rate at both test points.

Applied pressure	Flow
4500 psig	371 liters per minute
500 psig	303 liters per minute

E. EXHALATION RESISTANCE TEST – NIOSH Test Procedure No. 122

42 CFR Part 84 Reference: Subpart H, § 84.91 (c)

Requirement:

The exhalation resistance of pressure-demand apparatus shall not exceed the static pressure in the facepiece by more than 51 mm. (2 inches) water-column height.

Procedure:

The facepiece is mounted on an anthropometric head form. A probe in the head form is connected to a slant manometer for measuring exhalation breathing resistance. The air flow through the apparatus is adjusted to a rate of 85 liters per minute and the exhalation resistance is recorded.

Results – Tested on March 7, 2007, with SCBA in as-received condition.

The difference between the exhalation breathing resistance and static pressure for the SCBA fell within the NIOSH required range.

Exhalation Breathing Resistance:	2.50	INWC
Static Pressure:	0.90	INWC
Difference:	1.60	INWC

F. REMAINING SERVICE LIFE INDICATOR TEST – NIOSH Test Procedure No. 124
42 CFR Part 84 Reference: Subpart H, § 84.83 (f) and Subpart G, § 84.63 (c)

Requirement:

Each remaining service life indicator or warning device shall give an alarm when the remaining service life of the apparatus is reduced within a range of 20 to 25 percent of its rated service time or pressure.

This requirement is modified under § 84.63(c) as follows: *For apparatus which do not have a method of manually turning off remote gage in the event of a gage or gage line failure the remaining service life indicator is required to be set at $25\% \pm 2\%$ of the rated service time or pressure.*

Procedure:

A calibrated gauge is connected in line between the air supply and the first-stage regulator. The unit is then allowed to gradually bleed down. When the low-air alarm is activated, the pressure on the gauge is recorded. This procedure is repeated six times. The average of the six readings is calculated and recorded.

Results – Tested on March 7, 2007, with SCBA in as-received condition. As this SCBA does not have a remote gauge shutoff, the test requirement is $25\% \pm 2\%$. This unit incorporates two alarms—a whistle and a flashing gauge light.

Both alarms activated within the required range (between 1035 and 1215 psig).

Test #	Whistle Alarm Point (psig)	Gauge Light Alarm Point (psig)
1.	1140	1065
2.	1140	1055
3.	1140	1055
4.	1145	1070
5.	1140	1065
6.	1140	1060
Avg.	1141	1062

G. NFPA AIR FLOW PERFORMANCE TEST

NFPA 1981 (1997 Edition) Reference: Chapter 5, Performance Requirements, Sec. 5-1.1

Requirement:

SCBA shall be tested for air flow performance as specified in Section 6-1, Air Flow Performance Test, and the SCBA facepiece pressure shall not be less than 0.0 INWC nor greater than 3.5 INWC above ambient pressure from the time the test begins until the time the test is concluded.

Procedure:

A model 327-6 breathing machine as specified in Paragraph 6-1.12 operating at 30 ± 1 RPM with a 103 ± 3 liters per minute flow rate is connected to an anthropometric head for cycling. A pressure tap in the head is connected to a transducer which in turn is connected to a flatbed chart recorder for determining the pressure in the facepiece.

Results – Tested on March 23, 2007, with SCBA in as-received condition.

The inhalation pressure remained above ambient, but the exhalation facepiece pressure exceeded 3.5 INWC during the test. A rattling noise was observed coming from the exhalation valve. For about 10-20% of exhalation cycles this did not occur; on those cycles the exhalation pressure was approximately 3.10 INWC. The SCBA **did not** meet the NFPA test requirements.

Maximum Facepiece Pressure:	3.90	INWC
Minimum Facepiece Pressure:	1.10	INWC

III. Disposition:

Following testing, the SCBA was returned to the package in which it was shipped to NIOSH. It was subsequently shipped back to the Baltimore City Fire Department on April 5, 2007.

The results of all tests are summarized in Tables One and Two which follow.

TABLE ONE – Summary of NIOSH Test Results

Task Number: 14886
Manufacturer: Dräger Safety
NIOSH Approval Number: TC-13F-379
Tests Performed By: Vance Kochenderfer
Dates of Tests: March 7 and 23, 2007

TEST / 42 CFR PART 84 REFERENCE	STANDARD	RESULT	PASS	FAIL
A. POSITIVE PRESSURE TEST Reference: Subpart H, § 84.70 (a)(2)(ii)	> 0.00 INWC	cylinder exhausted		X
B. RATED SERVICE TIME TEST Reference: Subpart F, § 84.53 (a), Subpart H, § 84.95 (a) and (b)	≥ 45 min.	37 min, 40 s		X
C. STATIC PRESSURE TEST Reference: Subpart H, § 84.91 (d)	≤ 1.50 INWC	0.90 INWC	X	
D. GAS FLOW TEST (at Full Cylinder Pressure) Reference: Subpart H, § 84.93 (b) and (c)	≥ 200 lpm	371 lpm	X	
D. GAS FLOW TEST (at 500 psig) Reference: Subpart H, § 84.93 (b) and (c)	≥ 200 lpm	303 lpm	X	
E. EXHALATION RESISTANCE TEST Reference: Subpart H, § 84.91 (c)	Difference ≤ 2.00 INWC	1.60 INWC	X	
F. REMAINING SERVICE LIFE INDICATOR TEST (whistle) Reference: Subpart H, § 84.83 (f) and Subpart G, § 84.63 (c)	Between 1035 and 1215 psig	1141 psig	X	
F. REMAINING SERVICE LIFE INDICATOR TEST (gauge light) Reference: Subpart H, § 84.83 (f) and Subpart G, § 84.63 (c)	Between 1035 and 1215 psig	1062 psig	X	

NOTE: The Positive Pressure Test and Rated Service Life Test are run simultaneously.

TABLE TWO – Summary of NFPA Test Results

TEST / REFERENCE	STANDARD	RESULT	PASS	FAIL
G. NFPA AIR FLOW PERFORMANCE Reference: NFPA 1981 (1997 Edition), Section 5-1.1	≤ 3.50 INWC Exhalation Resistance	3.90 INWC		X
G. NFPA AIR FLOW PERFORMANCE Reference: NFPA 1981 (1997 Edition), Section 5-1.1	≥ 0.00 INWC Inhalation Resistance	1.10 INWC	X	

Appendix IV

Images



National Personal Protective Technology Laboratory / Technology Evaluation Branch

IMAGES

One Self-Contained Breathing Apparatus
Submitted by the Baltimore City Fire Department
Baltimore, Maryland

NIOSH Task No. 14886

List of Figures:

- Figure 1: SCBA as Received from the Baltimore City Fire Department
- Figure 2: SCBA in Carrying Case
- Figure 3: SCBA Ready for Inspection
- Figure 4: Facepiece
- Figure 5: Visibility through Facepiece Lens
- Figure 6: Demand Valve Attachment Port
- Figure 7: Demand Valve
- Figure 8: Side View of Demand Valve
- Figure 9: Metal Tag Attached to Demand Valve Hose
- Figure 10: Pressure Reducer
- Figure 11: Cylinder Connector Nut
- Figure 12: Buddy Breather Connection
- Figure 13: Remote Pressure Gauge
- Figure 14: Low-Air Alarm Whistle Outlet
- Figure 15: Label on Front of Backframe
- Figure 16: Heat Damage to Shoulder Strap Webbing
- Figure 17: Regulator Storage Point
- Figure 18: Cylinder
- Figure 19: Cylinder
- Figure 20: Cylinder DOT Label
- Figure 21: Cylinder Retest Label
- Figure 22: Damage to Cylinder Composite Layer
- Figure 23: Damage to Cylinder Composite Layer
- Figure 24: Damage to Cylinder Composite Layer
- Figure 25: Cylinder Valve
- Figure 26: Cylinder Valve Outlet

Figure 1 – SCBA as Received from the Baltimore City Fire Department



Figure 2 – SCBA in Carrying Case



Figure 3 – SCBA Ready for Inspection



Figure 4 – Facepiece



Figure 5 – Visibility through Facepiece Lens



Figure 6 – Demand Valve Attachment Port



Figure 7 – Demand Valve



Figure 8 – Side View of Demand Valve



Figure 9 – Metal Tag Attached to Demand Valve Hose



Figure 10 – Pressure Reducer



Figure 11 – Cylinder Connector Nut

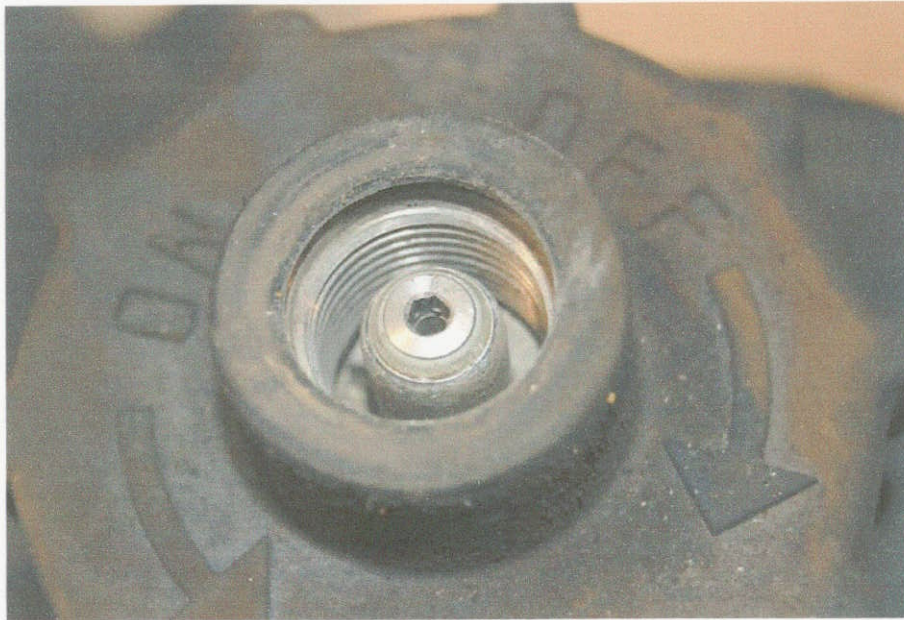


Figure 12 – Buddy Breather Connection



Figure 13 – Remote Pressure Gauge



Figure 14 – Low-Air Alarm Whistle Outlet

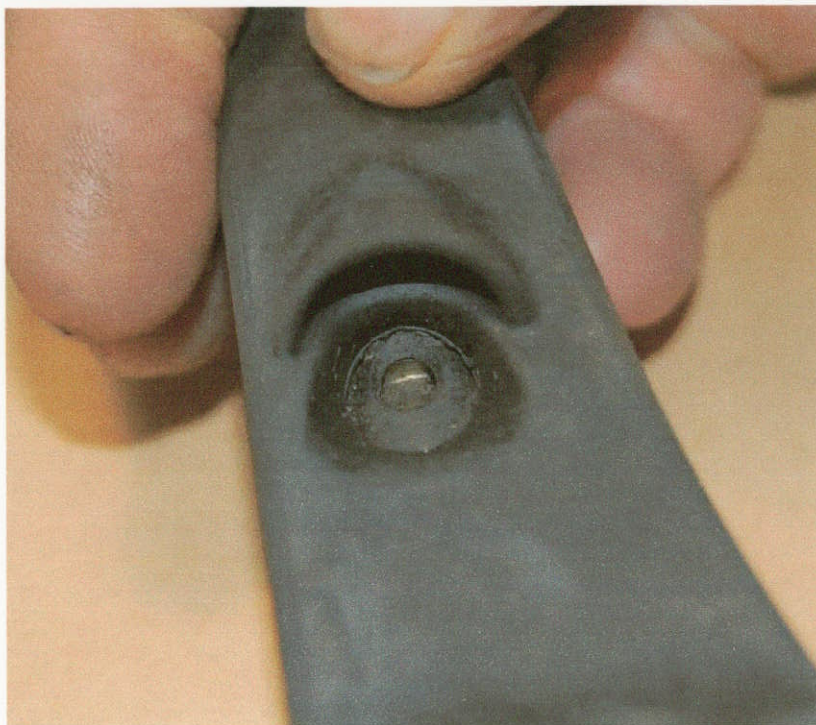


Figure 15 – Label on Front of Backframe



Figure 16 – Heat Damage to Shoulder Strap Webbing



Figure 17 – Regulator Storage Point

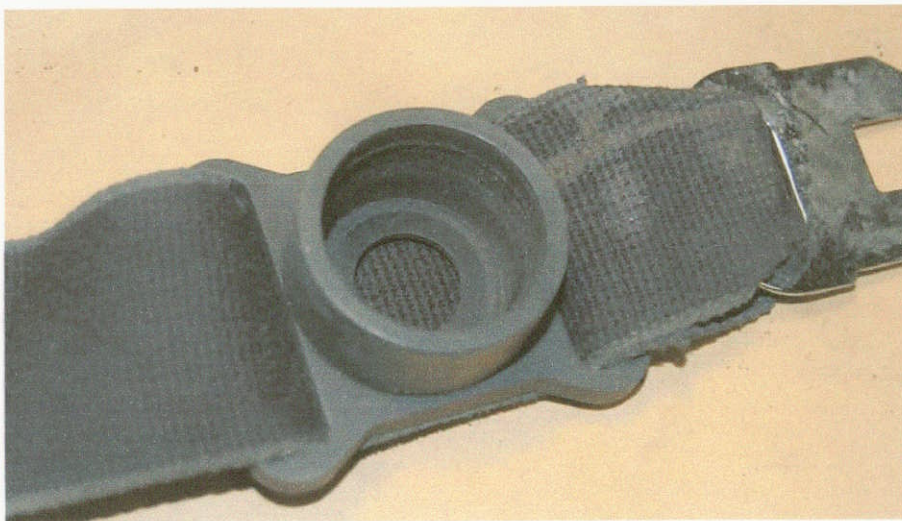


Figure 18 – Cylinder



Figure 19 – Cylinder



Figure 20 – Cylinder DOT Label

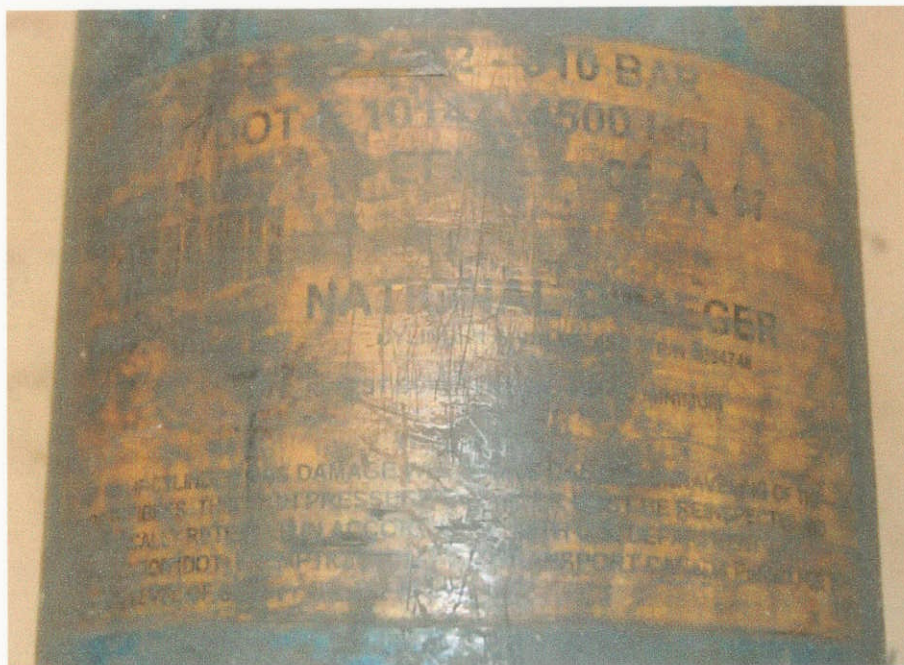


Figure 21 – Cylinder Retest Label



Figure 22 – Damage to Cylinder Composite Layer



Figure 23 – Damage to Cylinder Composite Layer



Figure 24 – Damage to Cylinder Composite Layer



Figure 25 – Cylinder Valve



Figure 26 – Cylinder Valve Outlet



Appendix E

BCFD Evaluation of SCBA



PosiChek3 Test Results

4/25/2007 2:34:23 PM

Facepiece Test

L00003

Manufacturer : Draeger
Model : PA-90 NFPA 4500
Serial Number : 000000

BCFD
Fire Academy

PosiChek3
calibration was up
to date when this
test was
performed.

Functional Tests

Facepiece Leak Test :	Fail	1.1	in. H2O
Exhalation Pressure :	Pass	2.2	in. H2O

Visual Inspection

Facepiece :	N/A
Backframe/Harness :	N/A
Cylinder :	N/A
Low Pressure Warning :	N/A
Hoses :	N/A

Tested by : Chester Andrzejewski
Organization : Baltimore City FD

Signature _____



PosiChek3 Test Results

4/25/2007 2:41:47 PM

Facepiece Test

L00003

Manufacturer : Draeger
Model : PA-90 NFPA 4500
Serial Number : 000000

BCFD
Fire Academy

PosiChek3
calibration was up
to date when this
test was
performed.

Functional Tests

Facepiece Leak Test :	Pass	0.8	in. H2O
Exhalation Pressure :	Pass	2.2	in. H2O

Visual Inspection

Facepiece :	N/A
Backframe/Harness :	N/A
Cylinder :	N/A
Low Pressure Warning :	N/A
Hoses :	N/A

AFTER RE-ADJUSTMENT

Tested by : Chester Andrzejewski
Organization : Baltimore City FD

Signature _____



PosiChek3 Test Results

4/25/2007 2:45:02 PM

Facepiece Test

PosiChek3
calibration was up
to date when this
test was
performed.

L00003

Manufacturer : Draeger
Model : PA-90 NFPA 4500
Serial Number : 000000

BCFD
Fire Academy

Functional Tests

Facepiece Leak Test :	Fail	0.0	in. H2O
Exhalation Pressure :	Pass	2.2	in. H2O

Visual Inspection

Facepiece :	N/A
Backframe/Harness :	N/A
Cylinder :	N/A
Low Pressure Warning :	N/A
Hoses :	N/A

① TESTED w/SLICK IN OUTSTRA
ROUND (C) FIRE GROUND - 1 STRUT ON
EACH OF TOP & BOTTOM LOOSE. (OPPOSITE SIDES)

Tested by : Chester Andrzejewski
Organization : Baltimore City FD

Signature _____



PosiChek3 Test Results

Complete SCBA Test

4/25/2007 3:00:29 PM

PosiChek3
calibration was up
to date when this
test was
performed.

L00001

Manufacturer : Draeger BCFD
Model : PA-90 NFPA 4500 AMR
Serial Number : BRUE-2242 6720 Pulaski Hwy. Balto. Md.

Apparatus

Location : E-41
Other ID : 520 S. Conkling St.

Functional Tests

Facepiece Leak Test : Pass 1.0 in. H₂O
Exhalation Pressure : Pass 2.3 in. H₂O
Pressure Gauge Test : Pass

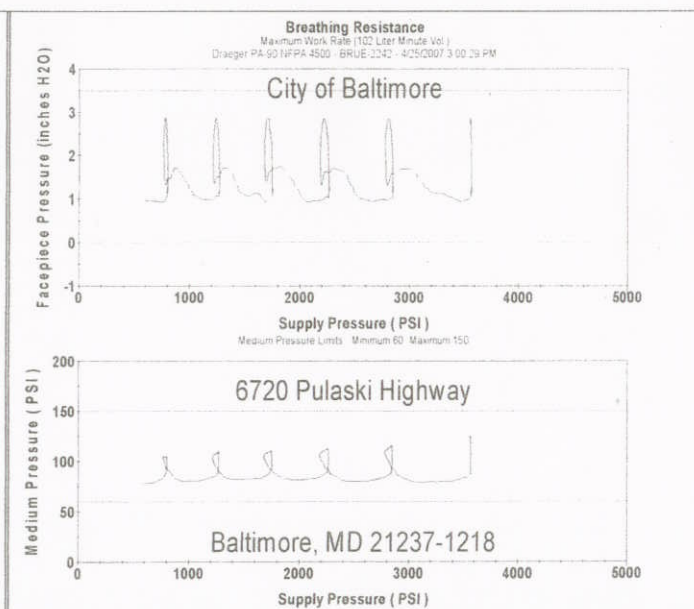
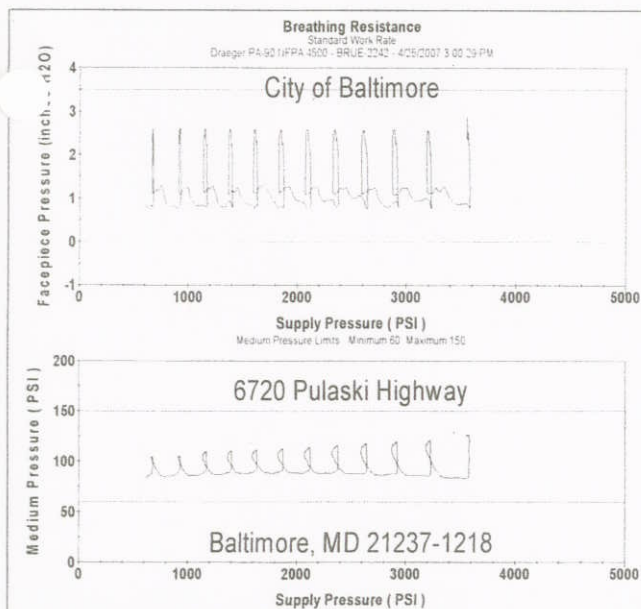
1500 PSI		2000 PSI		3000 PSI	
Pass	1427	Pass	1956	Pass	2940
Alarm Accuracy :		Pass	1071	PSI	
Activation Pressure :		Pass	-2.4	in. H ₂ O	
Static Facepiece Pressure :		Pass	0.7	in. H ₂ O	
Static Medium Pressure :		Pass	124	PSI	
Medium Pressure Change :		Pass	-6	PSI	

Visual Inspection

Facepiece : N/A
Backframe/Harness : N/A
Cylinder : N/A
Low Pressure Warning : N/A
Hoses : N/A

Redundant Alarm : Fail 960 PSI
Bypass Test : Fail 77 L/min
High Pressure Leakage : Pass 2 PSI

80 L/min
15 min



Minimum	Maximum		Breathing Results	Minimum	Maximum	
0.8 in. H ₂ O	2.9 in. H ₂ O	Pass	Facepiece Pressure	0.9 in. H ₂ O	2.9 in. H ₂ O	Pass
83 PSI	126 PSI	Pass	Medium Pressure	77 PSI	125 PSI	Pass

Tested by : Brian Pittinger
Organization : Baltimore City FD

Signature _____

BCFD Maintenance Record
BRUE-2242

Date	Action Taken
6/10/04	QIII Tested
6/11/04	Issued to E-41
9/21/04	P/M, QIII Tested
6/7/05	BN/OR (Leak was in cyl stem)
8/17/05	P/M, QIII Tested
8/15/06	P/M, Boot, QIII Tested

Appendix F

Manufacturers Protective Clothing Report

The following is a summary of the structural fire fighting ensembles that were reviewed at the City of Baltimore Fire Department on 10/20/06.



Attendees at inspection:

Karen Lehtonen – Lion Apparel
Mark Staten – Lion Apparel
Chief William Jones – City of Baltimore Fire Department
Lieutenant William Kern - City of Baltimore Fire Department
Lieutenant Cauldwell - City of Baltimore Fire Department
Meir Goldman – City of Baltimore Fire Department Legal Officer
Robert Fadrowski – Maryland Occupational Safety and Health

6 4 5 0
P O E A V E

The protective clothing and equipment for the following personnel were inspected:

Fire fighter Butler
Fire fighter Roberts
Fire fighter Mattox

Details of each garment and related equipment inspected follows this summary.

P.O. BOX 13576
DAYTON
OHIO
45413.0576

The City of Baltimore representatives present at the inspection provided the following account of the incident. No actual incident report was reviewed.

All three firefighters entered the structure through the front door of the residence. Firefighter Roberts was the first into the structure, followed by firefighters Mattox and Butler. They proceeded down a hallway to a stairwell leading to the second floor. The firefighters did not proceed beyond the first few stairs before they needed assistance being removed from the environment. Fire Fighter Butler was the first out, followed by Mattox and Roberts. A Rapid Intervention Team assisted all three men out of the structure. Mattox and Butler were assisted out but were still under their own power, Roberts required complete assistance. Based on a review of radio transmission it was estimated that the fire fighters were in this environment for 3-4 minutes.

According to news accounts on firehouse.com "WJZ'S Mary Bubala spoke to Fire Department spokesman Chief Kevin Cartwright says the first units reported heavy fire and smoke coming from a two-story brick row home." The same story accounted for the following: "A firefighter was killed early Tuesday battling an intense, two-alarm fire that quickly engulfed a row home in Greektown, causing a floor to collapse on top of him, fire officials said." During the gear inspection, a collapse was not confirmed.

After exiting the building, EMS had difficulty removing fire fighter Robert's coat as the hooks and dees of the closure were still hot to the touch. EMS attempted to cut the garment from fire fighter Roberts but it proved to be too difficult.

800.421.2926

TEL 937.898.1949
FAX 937.898.9204

PROTECTIVE
SYSTEMS
GROUP

The first set of gear reviewed was for Fire Fighter Mattox. Fire fighter Mattox was the second man in and the second man out. He suffered burns to both arms, primarily the left arm up to about the shoulder and on the right arm up to about the elbow. Burns were located around the circumference of the arm. He also had slight burns to the front of the neck, top of the chest and palm of the hands.

Coat

Black PBI Outershell
Rebound SRS Thermal Liner
Crosstech Moisture Barrier
Glide Face Cloth
Req: E916734
Date of Mfg: 10/9/2002
Cut: 08774701001
Size: 3835R

Pant

Black PBI Outershell
Crosstech Moisture Barrier
100% Aramid Quilt
Req: 314466
Date of Mfg: 3/3/2006
Cut: 106110AA001
Size: 32L

Coat Outershell Observations

The outershell fabric has turned slightly reddish in color in the area of the upper shoulders. The left upper arm band of trim has been burned and the substrate of the trim is exposed. All areas of the trim on the coat have turned a slight brownish/reddish color. There is no evidence of charring or embrittlement of the outer shell. On the left side of the front closure there is a tear between one of the hooks and dees. Over the thumb wristlets were used, however the burn to the hand was in an area not covered by the wristlet.

Coat Moisture Barrier Observations

The liner had been cut open by the fire department for further inspection. Based on viewing the materials, the moisture barrier had little to no discoloration or damage.

Coat Thermal Liner Observations

The face cloth of the Rebound thermal liner was discolored in the areas of the shell damage. The Rebound layer has stiffened slightly but it is still supple and strong. There is no damage to the glide face cloth. The liner materials are still very stable.

Helmet Observations

There was brown to black discoloration on the surface of the helmet. The welting on the helmet was either missing or damaged. The reflective trim on the helmet was charred and the Nomex ear cover was discolored but not charred. The flip down shield on the helmet were bubbling at the edges.

SCBA Facepiece Observations

The facepiece to the SCBA was observed and there was slight crazing to the lens of the facepiece.

Pant Observations

The pants were in good shape, there was no observed damage.

The second set of gear reviewed was for Fire Fighter Roberts. Fire fighter Roberts was the first man in and the third man out. Fire fighter Roberts suffered burns to his chest and neck area. At the time of this review and report this author does not know the cause of death.

Coat

Black PBI Outershell
Rebound SRS Thermal Liner
Crosstech Moisture Barrier
Glide Face Cloth
Req: F112746
Date of Mfg: 2/7/2003
Cut: 09059001017
Size: 4635L

Pant

Black PBI Outershell
Rebound SRS Thermal Liner
Crosstech Moisture Barrier
Glide Face Cloth
Req: F112840
Date of Mfg: 2/26/2003
Cut: 09100601014
Size: 44R

Coat Outershell Observations

The outershell of the coat exhibits reddening in the center chest portion of the garment. The left upper arm of the coat sleeve is discolored and the right sleeve is mildly discolored. The outer shell on the collar of the coat has also reddened in color. All areas of the outershell material are still supple and could not be torn by hand or by attempting to push through the material. The hook and loop closure on the throat tab has melted. The reflective trim is heavily damaged in several locations. The center portion of the chest trim has turned black and is starting to bubble. The left upper arm band of trim has discolored and the substrate has been exposed. The trim on the left arm has been discolored to a brown/black color. The chest trim on the back left side of the coat has blackened.

The shoulder pads inside the outer shell have melted and stuck to the adjacent outershell and thermal liner materials. The leather shoulder caps on the outside of the shell have stiffened. The majority of the damage to the coat is located from the chest trim up.

Coat Moisture Barrier Observations

The coat liner was cut open by EMS at the scene, therefore the moisture barrier inside the liner was able to be inspected. The moisture barrier was discolored in the areas of the damage to the outer shell. The film was browned, however all seam tape remained intact.

Coat Thermal Liner Observations

The face cloth of the Rebound thermal liner is discolored in the areas corresponding to the outer shell damage. In all areas the thermal liner material is still supple and strong. In the area of the heavy damage to the left shoulder there is some slight stiffening of the materials. There was no visible sign of damage to the Glide face cloth.

Pant Observations

The pants showed no visible heat damage, however they were covered in debris. The leather on the knees and pockets has stiffened.

Helmet Observations

Some of the reflective trim on the helmet has melted and the numbers on the helmet name shield have melted. The flip down shields have discolored but have not melted. The eagle on the helmet had been bent, however it was believed that this did not occur during this incident.

The third set of gear reviewed was for Fire Fighter Butler. Fire fighter Butler was the third man in and the first man out. He suffered minor burns to the inside of his right forearm and a 2nd degree burn on his left arm from his wrist to his elbow. Fire fighter Butler was treated and released from the hospital after the incident.

Coat

Black PBI Outershell
Rebound SRS Thermal Liner
Crosstech Moisture Barrier
Glide Face Cloth
Req: 309395
Date of Mfg: 8/3/2005
Cut: 103808AA004
Size: 4835R

Pant

Black PBI Outershell
Rebound SRS Thermal Liner
Crosstech Moisture Barrier
Glide Face Cloth
Req: 310857
Date of Mfg: 10/10/2005
Cut: 104479AF058
Size: 38L

Coat Outershell Observations

There is no discoloration of the outer shell fabric of the coat, however the reflective trim is damaged in several locations. There is mild discoloration to the chest trim and the right upper arm band of trim. Both the upper and lower arm bands of trim are heavily browned. The lettering on the rear of the coat is discolored in the areas where the SCBA did not cover. Most of the heat damage is to the left arm and right shoulder of the garment.

Coat Moisture Barrier Observations

The moisture barrier, which is sandwiched between the Rebound thermal liner and the Glide Face cloth was not inspected since the liner had not been cut open by the fire department.

Coat Thermal Liner Observations

The face cloth of the Rebound thermal liner was slightly browned and discolored on the left and right shoulder. The left shoulder had heavier damage than the right, which coincides with the damage to the outer shell. There is also some minor damage to the left sleeve upper shoulder. In all locations the Rebound thermal liner remained supple and strong.

Helmet Observations

The helmet exhibited heavy thermal damage. The reflective trim on the helmet had melted, and the flip down shield was browned and had bubbled. The name shield is charred and the welting around the edge of the helmet had melted. The Nomex ear covers on the helmet are darkened but are still supple and not to the point they have broken open.

Pant Observations

The pants were in good condition, there was no observed damage.

In summary, all three firefighters were exposed to a high level of heat to their upper bodies. The lack of exposure evidence on the equipment covering their lower bodies shows that the heat load in those areas was lower. Different parts of the protective equipment took the brunt of the damage on each fire fighter ranging from heavy damage to helmets, SCBA facepieces and the upper torso portion of the coats.

For comparative purposes only the following temperature ranges can be used for consideration of the exposure environment. It must be noted however that many of these data points are a result of convective heat exposures and do not account for any additional radiant heat exposure that most likely would have occurred in an actual fire ground environment. Reflective trim begins to brown after 350°F for 5 minutes and blackens at temperatures exceeding 500°F. The plastic used in flip down shields on helmets begins to soften at a temperature of 375°F. The black PBI/Kevlar outer shell material used begins to discolor at 400°F and the material itself degrades at 1200°F.

The above referenced temperatures do not represent exposures from actual fire ground exposure. They are controlled laboratory exposures with known time and temperature. Since exposure on the fire ground is not always known or steady and constant like in the laboratory this information can only be used for comparative purposes. Based on the visual damage noted and the duration of time in the environment, it can be theorized that these firefighters were exposed to a very high and intense heat load.

All three garments inspected were in proper working condition prior to the incident and appeared to be properly maintained. In addition all three were certified garments in compliance with NFPA 1971 requirements.

Summary prepared by:

Karen Lehtonen

Karen Lehtonen
Director PSG Products
Lion Apparel, Inc.

Appendix J

BCFD Manual of Procedure Fireground Operations and Command



MANUAL OF PROCEDURE

DETAIL PROCEDURE

SECTION

EMERGENCY SERVICES

SUBJECT

RAPID INTERVENTION TEAM
(TWO-IN TWO-OUT)

INFORMATION

To comply with **Federal Regulation '29CFR1910.134 Respiratory Standard'** fire departments are required to provide personnel for possible rescue of members operating in an **Immediately Dangerous to Life and Health (I.D.L.H.) Atmosphere**, or other situations where an equipment failure or sudden change in conditions may trap or injure personnel. The following operational procedures shall be implemented immediately.

INTERIOR STRUCTURAL FIRE FIGHTING

Members entering an I.D.L.H. atmosphere must enter with at least one other member (buddy system).

Members operating in any I.D.L.H. atmosphere must operate in teams of at least two members. One member of the team will be designated as the team leader.

Members are prohibited from operating in any I.D.L.H. atmosphere alone. Members of the team must remain in voice or visual contact with each other at all times while operating in the I.D.L.H. atmosphere.

At least two members must be located outside the I.D.L.H. atmosphere and be equipped to operate as a rescue team in the event the entry team is trapped or unable to exit from the I.D.L.H. atmosphere.

If initial attack personnel encounter a **known** life hazard situation where immediate action could prevent the loss of life or limb, deviation from the two-in/two-out policy will be permitted, as an exception.

Generally speaking, the Baltimore City Fire Department's standard for deviating from the two-in/two-out policy shall be based on the receipt of 1) a radio report from Fire Communications Bureau stating that a person has been reported trapped inside an IDLH atmosphere; or 2) a credible report from a civilian on the scene that a person is trapped inside an IDLH atmosphere.

Deviations from the two-in/two-out policy, including any actions taken in accordance with a deviation, will be thoroughly investigated by the Chief of Safety or his designee, with a special report submitted to the Chief of Fire Department. This exception is not to be confused with the standard mission of completing primary and secondary searches as standard operating procedures.

SECTION	SUBJECT
EMERGENCY SERVICES	RAPID INTERVENTION TEAM (TWO-IN TWO-OUT)

All members operating in I.D.L.H. atmospheres must utilize self-contained breathing apparatus (SCBA).

Units must be staffed with 4 members to successfully implement this policy. No I.D.L.H. operations will be conducted with fewer than four personnel.

FIREGROUND OPERATIONS

At least four members must be assembled on the fireground before interior operations may be started at the scene of a structural fire beyond the incipient stage.

These four members must be trained to at least the Firefighter II level and equipped with full turnout gear including S.C.B.A.

When operating at the scene of a structural fire beyond the incipient stage the officer and the nozzleperson of the first arriving engine may be the entry team ("two in"). The leadoff person of the first engine shall loop or connect the hydrant connection to the hydrant and proceed to the fireground. The leadoff person and the pump operator may be designated as the Initial Rapid Intervention Team (IRIT) ("two out"). The second dispatched engine company will cover and charge the hydrant of the first engine. The members of the second engine company, except the pump operator, shall report directly to the location of the first engine company. The leadoff person of the second engine company will become the second member of the IRIT relieving the pump operator of IRIT duties. If the first arriving engine company officer determines that conditions will require the full attention of the pump operator, the officer shall notify the second due engine to assume IRIT operations. The third and fourth engines will cover the opposite exposure [MOP 602-1].

The function of the Initial Rapid Intervention Team is to account for members working in IDLH atmospheres and initiate a firefighter rescue, as necessary. One member of the IRIT shall be solely assigned to monitor and track interior personnel. This fire fighter must be free of all other tasks in order to account for, and if necessary, initiate a rescue for those fire fighters inside, and shall be designated as the primary IRIT member. The other IRIT member is permitted to perform other tasks, but only if those tasks could be immediately abandoned without jeopardizing the safety and health of others at the emergency scene. This individual shall be designated as the secondary IRIT member.

All members of an entry team must exit the building when a SCBA or PASS Device activates, to ensure no one leaves or remains in the building alone.

RIT Operations

When the IC determines additional personnel are required to enhance the Initial Rapid Intervention Team operations, additional units may be requested. Assignment of units to meet this need will be the responsibility of the IC.

SECTION	SUBJECT
EMERGENCY SERVICES	RAPID INTERVENTION TEAM (TWO-IN TWO-OUT)

The Rapid Intervention Team is designated by the IC and assigned to a location determined by Command. The RIT must conduct an exterior recon while maintaining an awareness of companies' locations and scene conditions in their sector/Division. They must remain immediately available for deployment if needed.

The RIT shall be ready for deployment and must have full personal protective clothing and SCBA in standby. The RIT members must closely monitor tactical radio channels at all times for activities and status of companies. The RIT shall maintain knowledge of all company locations.

The IC may assign more than one RIT depending on the magnitude of the Incident. They should be located at entry points to the structure.

Upon arrival on the incident, The RIT Officer is to report to the IC to discuss and develop a RIT Action Plan.

The RIT Action Plan includes:

- Location of Team prior to deployment (RIT Staging Area)
- Member assignments (Tools/Duties)
- Equipment Staging/Gathering
 - Search Lines
 - Thermal Imaging Device
 - Hand Tools
 - SCBA Bag / PASS Key / Face Mask
- Accountability Workbook

Report of Missing or Trapped Fire Fighter

1. The IC shall assume an individual is lost, trapped, or missing until that individual or crew is accounted for. The actions taken by the IC to locate and rescue trapped fire fighters shall be quick and decisive.
2. Whenever a crew or individual is lost or missing, a "Mayday" shall be transmitted over the radio. The IC shall then initiate a rapid recall and accountability of all crews on the fire ground to determine who is missing.
3. The IC shall immediately assign a Chief Officer to the Rescue Sector/Group and commit the RIT to locate the missing or trapped crews. The RIT shall gather as much information as possible on the last known location and assignment of the missing firefighter(s).
4. The IC shall assign another company as a RIT once a RIT is deployed.
5. The IC shall request additional resources as necessary.

SECTION	SUBJECT
EMERGENCY SERVICES	RAPID INTERVENTION TEAM (TWO-IN TWO-OUT)

6. Fire fighting operations shall not be abandoned and it may be necessary to reinforce those operations. Ventilation and lighting are an important aspect in locating missing or trapped fire fighters.

7. The IC shall assign additional safety officers as necessary.

Rapid Intervention Team Search Considerations

1. The RIT should consider the following items when conducting a search for missing and trapped fire fighters:

- a. Visible sightings of arms, legs, or equipment
- b. Knowledge of last known location
- c. Sound of a SCBA or PASS device operating in low air or alarm mode, shouts for help, breathing or moaning, or tapping sounds. The RIT may have to occasionally stop to listen for these types of noises.
- d. Radio requests for help
- e. Tracing attack lines
- f. Building descriptions by lost fire fighters
- g. Flashlight beams
- h. Open and unlock all doors
- i. Complete a thorough search

2. In the event of a building collapse, the RIT should consider the potential for a secondary collapse.

3. The RIT must deploy with an air supply for trapped fire fighters as theirs may be depleted.

DEFINITIONS

Immediately Dangerous to Life and Health (I.D.L.H.) - An atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.

Rapid Intervention Team - firefighters located outside the I.D.L.H. atmosphere whose primary mission is to rescue trapped or missing firefighters.

SECTION	SUBJECT
EMERGENCY SERVICES	RAPID INTERVENTION TEAM (TWO-IN TWO-OUT)

Incipient fire - any fire which is in the initial or beginning stage and which can be controlled or extinguished by portable fire extinguishers, Class II standpipe, or small hose systems without the need for protective clothing or breathing apparatus.

Interior structural firefighting - means the physical activity of fire suppression, rescue or both, inside of buildings or enclosed structures, which are involved in a fire situation beyond the incipient stage.

Appendix G

BCFD Protective Clothing Report

Safety Office / MOSH Inspection

Personal Protective Equipment

Inventory Date: 10/12/2006

Member: Fire Fighter Roberts, Alan M., T-26, D/6

Department ID: 127

Time: 1030 Hours

Members Present

Chief Safety Officer: Mr. William H. Jones, Jr.

Safety Officer # 2: Lieutenant Steven Savino

Safety Officer #4: Lieutenant Kyle Caldwell

Maryland Occupational of Safety and Health:

The Following PPE was inventoried with contents and condition noted photographed by both Baltimore City Fire Department and MOSH.

1. Helmet (1)
2. Boots (1 pair boots)
3. Gloves (1 pair gloves)
4. Turnout Coat (1)
5. Turnout Pant (1)
6. Pass II Device (1)
7. SCBA Harness w/ Bottle (1)
8. Face piece (1)
9. Flashlight (1)
10. Portable radio (1)
11. Hood (1)

Missing Equipment

Hood (1)

Portable (1)

Flashlight (1)

1. Helmet

- a. *Condition*- Evidence of light heat exposure on ear flops, unable to ascertain when damage occurred. Chin strap displayed small/light heat exposure, unable to ascertain when done. Impact lining has a hole in the middle, unable to ascertain when done.
- b. *Manufacturer* – Cairns classic 1000
- c. *Photographed*_

2. Boots

- a. *Condition*- No unusual scorching/discoloration
- b. *Manufacturer*- Pro-Warrington
- c. *Photographed*-

3. Gloves

- a. *Condition*- 3 Misc. sets of gloves, none marked, unsure of member issued
- b. *Photographed*-

4. Turnout Coat

- a. *Contents* (outside) - (Left) pocket. Hose strap/(Right) pocket Spanner, 3 Lighters, 1 Screwdriver
- b. *Condition* (outside back) – Extreme heat exposure middle of back to collar. Evidence of collar being in folded down/crumpled position. (Tears/Cuts apparent to be from EMS)
- c. *Condition* (outside front) - severe heat exposure from middle of front to top collar, majority of exposure to (Left) side and middle
- d. *Condition* (inside) - No apparent discoloration to thermal layer, vapor barrier show some signs of heat exposure and melting of shoulder pad to liner .
- e. *Manufacturer information*- Jamesville CDX M2K – 00 model, Manufacturer date 02-07-03
- f. *Photographed*-

5. Turnout Pants

- a. *Condition* (outside) - No evidence of scorching/discoloration, (straps cut off by EMS personnel) No significant findings
- b. *Condition* (inside) – No significant findings
- c. *Contents* (right pocket) -1 shoulder pad, 1 napkin (rear pockets) empty

- d. *Manufacturer* - not recorded
- e. *Photographed* -

6. Pass device – Super Pass II

- a. *Condition* - in tact and functional, was removed from SCBA
- b. *Manufacturer* –
- c. *Photographed* -

7. SCBA Harness w/ bottle

- a. *Condition* (harness) - straps intact, shows no evidence of direct flame contact
- b. *1st and 2nd stage regulators* - appear to be operational. 2nd stage regulator bypass knob found in free flow position but unable to determine if or when it was activated.
- c. *Hose condition* (harness hose) – show evidence of heat exposure (top of shoulders and front)
- d. *Manufacturer* – Draeger
- e. *Model*: PA-90 NFPA 4500
- f. *Serial Number* - BRUE 2242
- g. *Assigned* : Engine 41, 520 Conkling Street
- h. *Last test date* – 8/15/2006
- i. *Condition (bottle)* - PSI reading 1800 Ibs (chest gauge reading) General condition of cylinder looks worn; knob on cylinder was slightly bent but operational. Exposure to light to medium *heat/scorch*, nothing to disrupt proper operation indicated at this time, melting was found on air gauge indicator of cylinder,
- j. *Last test date*- N/A
- k. *Photographed*-

8. Face Piece

- a. *Condition-* appears to be in serviceable condition. 2 of straps pulled and 3 un-pulled.
- b. *Manufacturer-* Draeger *Model:* Panarama *Style:* Nova
- c. *Last fit test date-* 4/4/06 Fire Academy
- d. *Protocol-* OSHA 29CFR1910.134
- e. *Photographed*

9. Flashlight

- a. *Condition-*
- b. *Manufacturer-*
- c. *Photographed-*

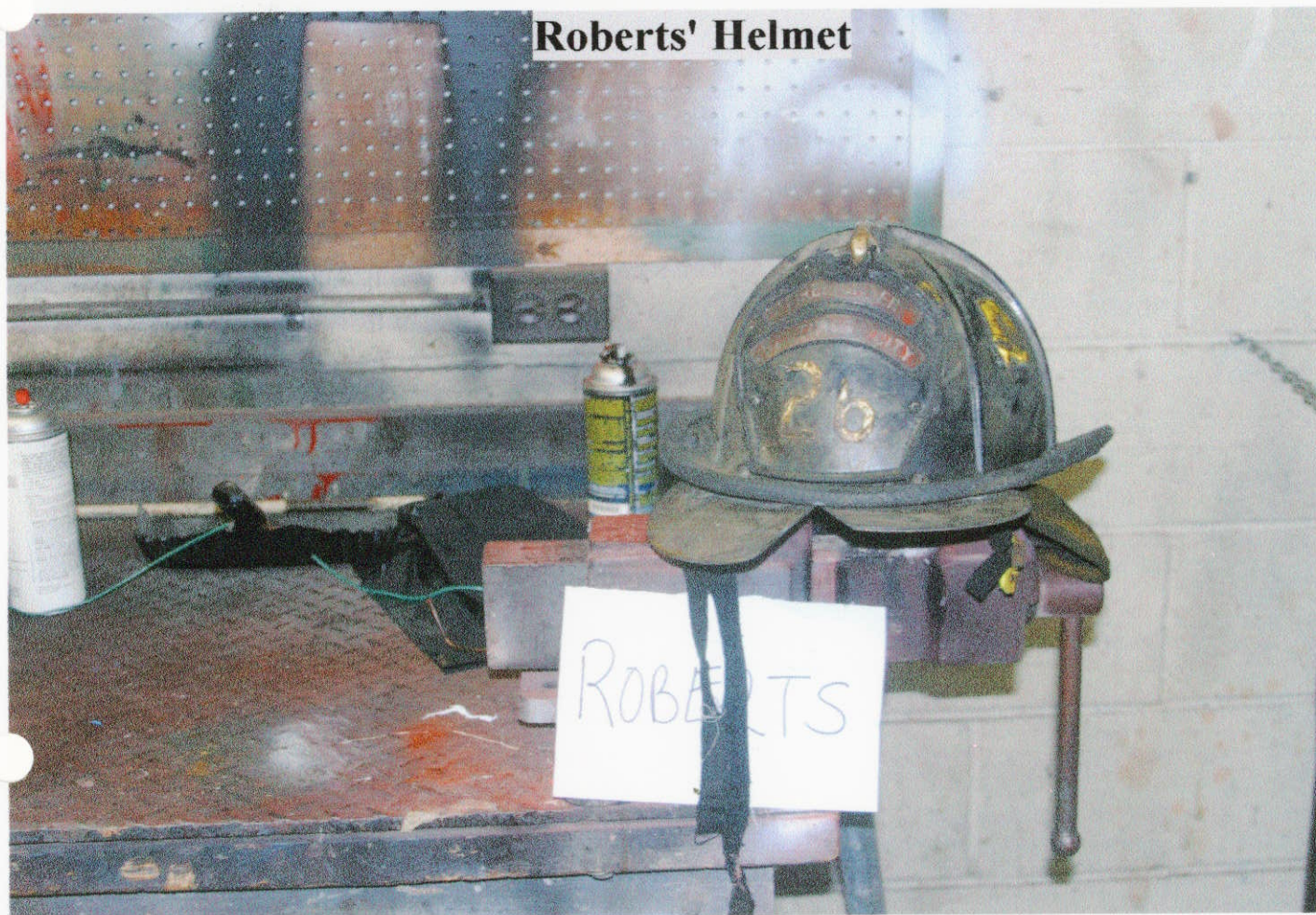
10. Hood

- a. *Condition-*
- b. *Manufacturer-*
- c. *Photographed-*

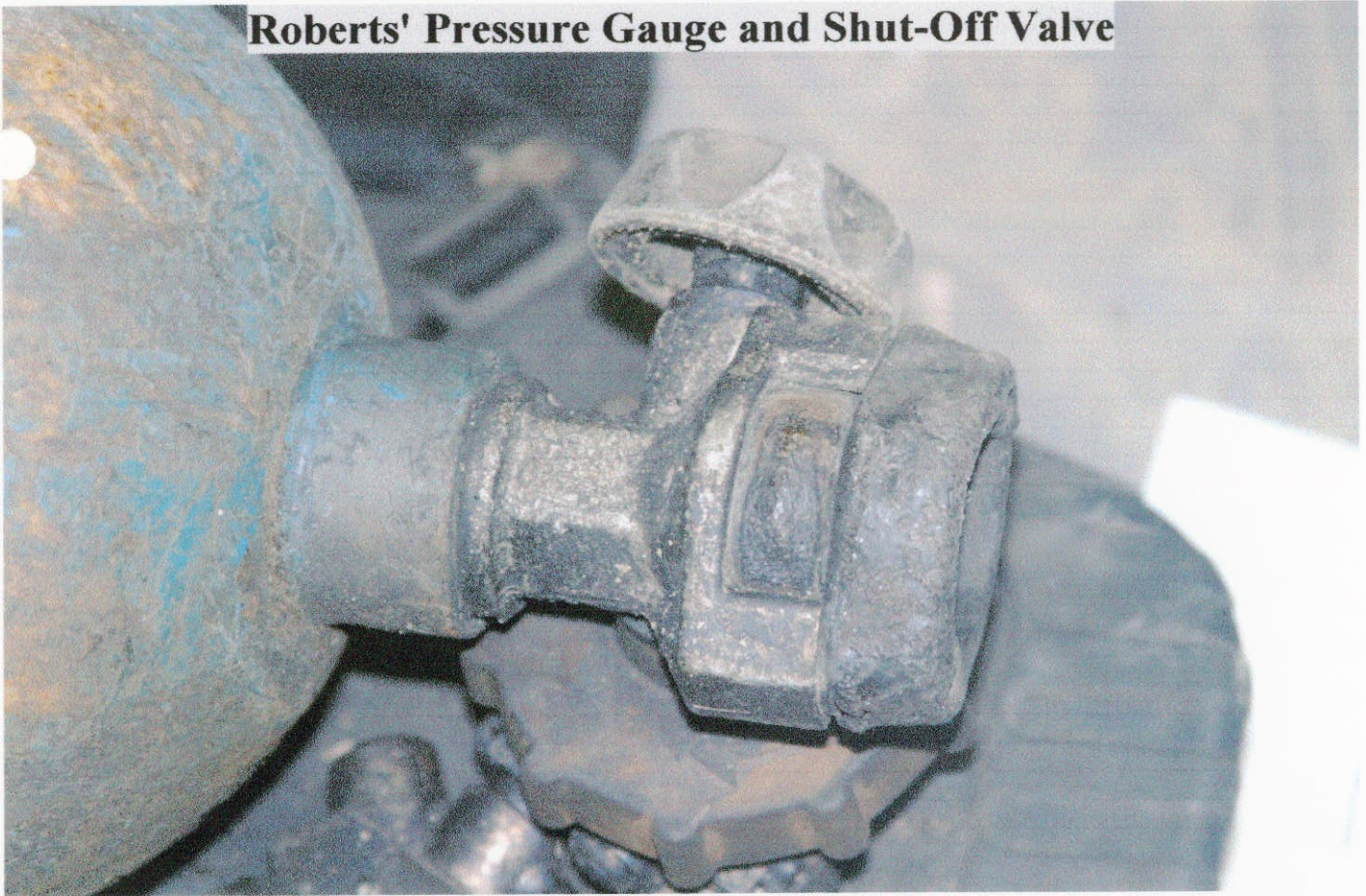
Roberts' Coat



Roberts' Helmet



Roberts' Pressure Gauge and Shut-Off Valve



Roberts' Face Piece



Mattox's Coat



Mattox's Coat



Mattox's Helmet



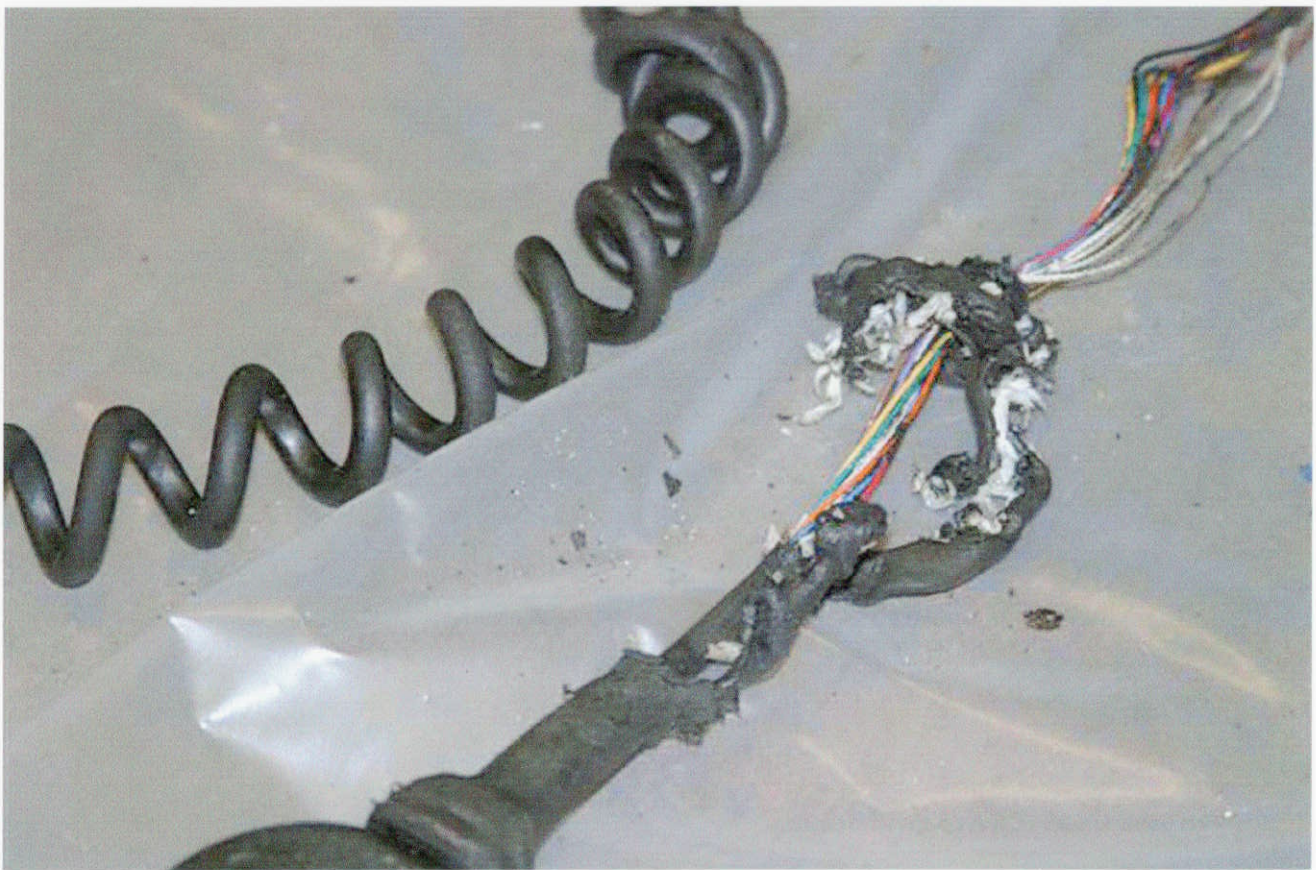
MATTOX

Mattox's Face Piece





This photo shows the condition of Mattox's portable radio. The wires to the remote microphone received heat damage.



This is a close-up view of the damage to Mattox's portable radio caused by the excessive heat.

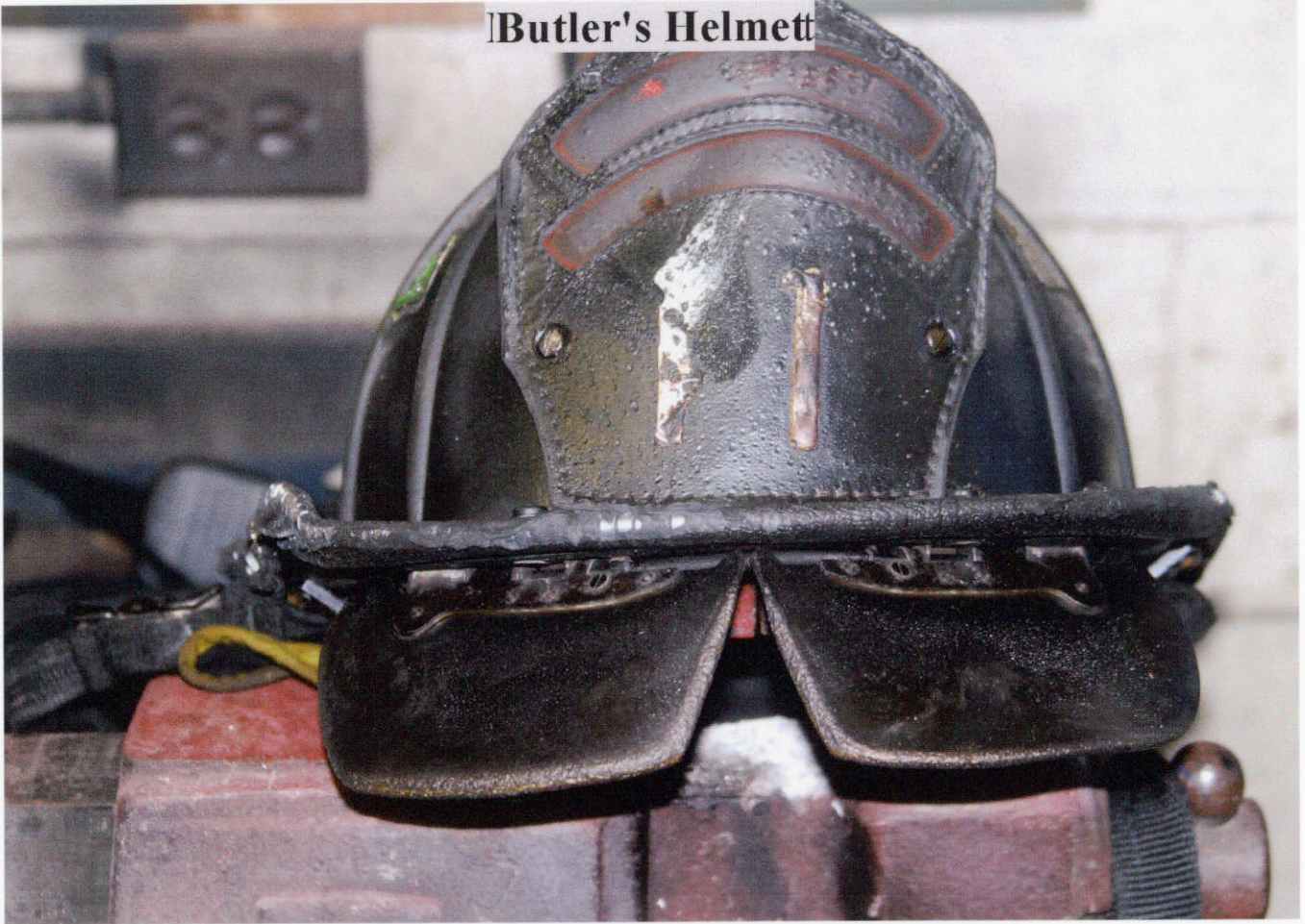
Butler's Face Piece



Butler's Coat



Butler's Helmet



Butler's Helmet






This photo shows the condition of Butler's portable radio. The remote microphone is missing because it was damaged and lost as a result of the heat encountered by FPA Butler.

Appendix H

MOSH Investigation Report

F R O M	Name & Title	<i>A</i> Meir Goldman, Legal Officer	CITY OF BALTIMORE MEMO	
	Agency Name & Address	Division of Occupational Safety, Finance 401 E. Fayette Street, 7 th Floor 6-3738		
	Subject	(M)OSHA Inspection Concerns		

To: William J. Goodwin, Jr., Chief,
Baltimore City Fire Department
401 E. Fayette Street
Baltimore, Maryland 21202

Date: February 9, 2007

On October 10, 2006 the Maryland Occupational Safety and Health Administration [(M)OSHA] inspected the Baltimore City Fire Department (BCFD). The inspection included all responders to a fire at 512 Macon Street earlier that morning that led to the fatality of one of its members. On February 8, 2007 Maryland OSHA informed BCFD that **NO CITATIONS** will be issued in this case (A1857-001-07) to the City of Baltimore. The case was held to be "**In Compliance**" and is now considered closed (by the State, it remains open with NIOSH at the Federal level).


The Division of Occupational Safety (DOS) wanted to wait until this case was closed before bringing our concerns to you regarding a serious lapse in following City procedures. This was the **SECOND** consecutive (M)OSHA case with the Fire Department that the DOS was **NOT NOTIFIED of the inspection**. (The last time was case number X183502106 at Engine 29 that ultimately led not only to citations to the Mayor & City Council for the Fire Department but also ended up in a dual inspection by a second section of (M)OSHA.)

The Baltimore City Department of Finance, Division of Occupational Safety (DOS) continues to represent the Mayor and City Council in abating or defending all alleged violations to the Maryland Occupational Safety and Health standards. It is not necessary to contact the Maryland Occupational Safety and Health Administration.

It is very important that DOS be called to every Maryland OSHA inspection. This strongly works to your advantage in these cases. DOS will advise you during the proceedings, will act as a liaison to the State (working to prevent additional inspections and citations), will clear all document submissions with the Law Department (wherever required) prior to State submission and will prepare a proper legal defense. DOS was key in this fatality case in acting as a liaison to be the center point for collecting all the items that (M)OSHA needed in a timely fashion in order to insure that no citations were issued.

If you have any questions or for any abatement assistance that is needed, please do not hesitate to call me on 410-396-3738.

cc: Susan C. Shawver, Risk Manager, Finance
Susan J. Schuder, Chief, Occupational Safety, Finance
Chief William H. Jones, Jr., Safety Officer, BCFD

FROM	NAME & TITLE	Valerie C. Walters, Risk Manager <i>W</i>	CITY of BALTIMORE MEMO	
	AGENCY NAME & ADDRESS	Department of Finance, Office of Risk Management 401 East Fayette Street, 5 th Floor		
	SUBJECT	(M)OSHA Inspection		

TO

DATE:

ALL DEPARTMENT HEADS

March 12, 2004

The Annotated Code of Maryland, Labor and Employment Article, Title 5. Occupational Safety and Health Subtitle 2. Administration and Enforcement, Section 5-208 gives authority to the Maryland Occupational Safety and Health Administration (M)OSHA to inspect Maryland worksites. This includes City worksites.

A (M)OSHA inspector may come to a city worksite without warning. However, (M)OSHA provides that a representative of the employer shall be given an opportunity to accompany the inspector during the inspection of the workplace. For our purposes "the employer" is defined as the Mayor and City Council. The Division of Occupational Safety is charged with the responsibility of representing the City in cases involving (M)OSHA by City Council Ordinance Number 57 (1980) and by Baltimore City Code (1995) Article 1 Section 50. Therefore personnel from this office are the "employer representative".

As a consequence of these inspections, citations for alleged violations of the Occupational Safety and Health Act are issued by (M)OSHA against the City. These citations have serious implications, which can be compounded by repeat violations or slow abatement. Offhand, verbal declarations by supervisors against the City can turn out to be points of contention at the subsequent State Administrative Hearings. Citations are not just safety improvement lists; they are charges of violations of law against the City.

Therefore, all agencies are directed to fully cooperate with the Division of Occupational Safety by **notifying that office immediately (at 396-4311) upon the appearance of a (M)OSHA inspector.** Inform the inspector that the Division of Occupational Safety, by City Council Ordinance, is the **only legal representative of the Mayor and the City Council.** Inform the inspector that a Legal Officer or Safety Officer from the Division of Occupational Safety will **immediately** come to the site to accompany the inspector during his inspection of the workplace. Disseminate this information to all sites and to all supervisory personnel. Please cooperate further by having a representative of your Agency accompany the inspector and the Legal Officer or Safety Officer with authority to tag faulty equipment out-of-service and to order other simple abatements. This will cut down considerably on the number of citations being issued against the City.

If you have any questions on this policy, please call (410)396-4205.

cc: Safety Officers

Appendix I

BCFD Operations Memos (Past and Current) And Manual of Procedure Policy on Rapid Intervention Team (RIT)



Baltimore City Fire Department Operations Memo



No. 20-05

Name & Title: Deputy Chief Frank F. Snyder, Jr.

Subject: Rapid Intervention Team

To: Operations

Date: December 7, 2005

Attention All Unit Officers:

- The current procedure of communications designating the 5th Engine Company as RIT as outlined in (MOP 515-11), will be discontinued.
- A fifth engine will continue to be dispatched as an additional resource for the Incident Commander.
- The responsibility for establishing RIT before interior operations can begin will be on the 1st arriving unit officer or the Incident Commander. (MOP 602-8)
- The Incident Commander will manage their resources in a way so that RIT is always in place throughout the entire incident.

Division Chief

Frank F. Snyder, Jr.
Deputy Chief, Operations



Baltimore City Fire Department Operations Memo



No. 17-06

Name & Title: Acting Deputy Chief Gregory B. Ward

Subject: Rapid Intervention Team (RIT)

To: Operations

Date: December 4, 2006

Attention:

The following changes to MOPs 602, 602-4 and 602-8 will become effective at 0700 hours 12/10/06:

- Fire Communications will designate the third assigned Engine Company/Squad as the RIT Company during the dispatch announcement on talk group A2.
- The first assigned Battalion Chief will call the third assigned Engine Company/Squad on the assigned fireground talk group to verify their assignment as the RIT Company.
- The fourth assigned Engine Company/Squad will assume the responsibility formerly assigned to the third assigned Engine Company/Squad as stated in MOP 602 page 1 of 5; 1. Level 1 – staging paragraph B.
- The fifth assigned Engine Company/Squad will assume the responsibility formerly assigned to the fourth assigned Engine Company/Squad as stated in MOP 602 page 2 of 5; paragraph D.

All members are to be made aware of these procedural changes as soon as possible.

Members are reminded that the Incident Commander is responsible for establishing the IRIT (two in / two out) before initiating interior fire fighting operations. (MOP 602-8)

All units are to review the procedures and options found in MOP 602-8 for establishing RIT and maintaining RIT for the duration of incidents. Incident Commanders must effectively manage their resources to insure the integrity of RIT when required.

The Department will be conducting additional training in the two in / two out rule, RIT procedures and fireground safety that will include a review of policy, procedures and equipment.

Division Chief

Gregory B. Ward
Acting Deputy Chief Operations



**MANUAL
OF
PROCEDURE

POLICY**

SECTION

EMERGENCY SERVICES

SUBJECT

FIREGROUND OPERATIONS
AND COMMAND

FIREGROUND OPERATIONS AND COMMAND

OBJECTIVES

Command procedures are designed to accomplish the following:

- Fix the responsibility for Command on a certain individual through a standard identification system depending on arrival sequence of units and officers.
- Insure that strong, direct and visible Command will be established as early as possible in the operation.
- Establish an effective framework outlining the activities and responsibilities assigned to Command.
- Provide a system for the orderly transfer of Command to subsequent arriving officers.

I. ESTABLISHING COMMAND

The member in charge of the first suppression unit to arrive at the scene of multiple unit responses shall assume Command and remain in Command until relieved by a higher-ranking officer or until the incident is terminated.

II. INITIAL REPORT

The member in charge of the first suppression unit to arrive shall immediately transmit a brief initial report via radio on designated talkgroup. The initial report shall include the following:

1. Unit identification on the scene
2. Building description (occupancy, size, arrangement, construction, and address)
3. Obvious fire conditions
4. Assume command

The terminology used in this report is identified in the Communications Procedure [MOP 515-2-1].

SECTION EMERGENCY SERVICES	SUBJECT FIREGROUND OPERATIONS AND COMMAND
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III. BATTALION CHIEFS

When arriving on the scene of an incident Battalion Chiefs will notify Fire Communications on the designated talkgroup of the following:

1. Report arrival on the scene.
2. Establish or assume command of the incident if the Battalion Chief determines it necessary to do so.
3. Transmit size-up report within 5 minutes of assuming command of the incident.
4. Give a status report at ten-minute intervals until the incident is placed under control.

IV. RADIO DESIGNATION

1. The radio designation "COMMAND" will be used with a brief description of the incident location. (i.e., "North Avenue Command," "Hopkins Command" etc.). This designation will not change through the duration of the incident.
2. Except in cases of emergency, all transmissions from fireground to Fire Communications will go through Command.

V. WORKSHEETS

At complex tactical situations, i.e. working fires, additional alarms etc., **Command will use a Tactical Worksheet** form (28-2100-0002) to outline and record assignments and to assist in the transfer of Command.

VI. TRANSFER OF COMMAND

The first Fire Department suppression unit to arrive on the scene will assume and retain Command until relieved by a ranking officer within the following guidelines.

1. When dispatched by Fire Communications:
 - A. The first arriving ranking officer will assume Command until arrival of the Battalion Chief.
 - B. The first arriving Battalion Chief will assume Command upon arrival if they determine it necessary to do so.
 - C. The Division Chief will assume Command upon arrival if the Division Chief determines it necessary to do so.

SECTION	SUBJECT
EMERGENCY SERVICES	FIREGROUND OPERATIONS AND COMMAND

2. The above guidelines under transfer of Command do not preclude the response of any Chief Officer to an incident for observation or informational purposes. Assumption of Command in these situations would be discretionary.

NOTE: Chief Officers assuming Command will have Fire Communications make an announcement on the assigned fireground talkgroup confirming same and identifying the location of Command (i.e., "North Avenue Command," "Hopkins Command" etc).

Within the chain of command indicated above, the actual transfer of command will be regulated by the following procedures:

1. Arriving ranking officers assuming Command will communicate with the officer being relieved by radio or preferably face-to-face on arrival.
2. The officer being relieved will position them self in front of the building and brief the officer assuming Command indicating the following:
 - A. General situation status
 - B. Deployment and assignments of operating companies
 - C. Appraisal of needs for additional resources at that time
3. The officer being relieved should review the tactical worksheet with the ranking officer in complex situations; this sheet provides the most effective framework for Command transfer as it outlines the location and status of resources in a standard form that should be well known to all members.

Command officers should eliminate all unnecessary radio traffic unless such communications are required to insure that command functions are initiated and completed.

The arrival (in itself) of a ranking officer on the fireground does not mean Command has been transferred to that ranking officer. Command is transferred only when the outlined communication functions have been completed.

The response and arrival of ranking officers on the fireground strengthen the overall Command function. All officers will exercise their Command prerogative in a supportive manner that will insure a smooth transition and effective on-going function of Command.

SECTION

SUBJECT

EMERGENCY SERVICES

FIREGROUND OPERATIONS AND
COMMAND**VII. COMMAND RESPONSIBILITIES**

Command is responsible for the following tasks as required by the circumstances of the situation within their judgement.





INITIAL:

1. Assume an effective Command position.
2. Transmit a brief initial radio report.
3. Rapidly evaluate situation (size-up).
4. Develop a plan of attack.
5. Assign units as required.
6. Provide continuing overall Command and progress reports within the framework of the Baltimore City Fire Department fireground procedures until situation is normalized.
7. Divisions and Groups

DIVISION: The partition of an incident into GEOGRAPHIC areas of operations. Divisions are established when the number of resources exceeds the manageable span of control of the Operations Chief.

GROUP: Established to divide the incident management structure into FUNCTIONAL areas of operation. Groups are composed of resources assembled to perform a special function not necessarily within a single geographic division.

Reference to the fire building will be by number according to floor height (story) and letter in clockwise rotation as follows:

- Side Alpha  - front of building
- Side Bravo  - left side of building (facing front of building).
- Side Charlie  - rear of building
- Side Delta  - right side of building (facing front of building).

SECTION	SUBJECT
EMERGENCY SERVICES	FIREGROUND OPERATIONS AND COMMAND

8. Review and evaluate attack efforts and revise plan of attack as needed.
9. Request and assign additional units as necessary.
10. Return units to service as soon as practicable.

COMMAND OPTIONS

In cases where the initial arriving officer is a Command officer, their efforts should automatically be directed towards the listed functions. An initial arriving unit officer, however, must decide on an appropriate commitment for unit consistent with the particular circumstances. Generally these can be categorized into three broad areas:

1. **Investigative Mode**: These situations generally require investigation by the first-arriving engines and truck companies. Normally the initial Fireground Commander (FGC) can go with the company to check while utilizing the portable radio to continue Command.
2. **Fast Attack Mode**: Incidents where immediate action is required to stabilize the situation; such as, interior fires in residences, apartments, or small commercial occupancies, which requires Command to quickly decide how to commit units. Where a fast interior attack is critical, Command can utilize the portable radio to permit necessary involvement in the attack without neglecting Command responsibilities. This mode should not last more than a few moments and will end with one of the following:
 - Situation is stabilized.
 - Battalion Chief arrives and Command is transferred.
 - Situation is not stabilized and Command must remove them self to a normal Command position.
3. **Command Mode**: Situations that will require command operations. Such situations that by virtue of the size of the fire, the complexity and/or potential of the occupancy or the possibility of extension require strong direct overall command from the outset of the arrival of the Fireground Commander (FGC). In such cases, the FGC will initially assume a Command position and maintain that position until relieved by ranking officer.

SECTION

EMERGENCY SERVICES

SUBJECT

FIREGROUND OPERATIONS AND
COMMAND

NOTE: While the unit officer assuming the role of FGC has a choice of modes and degrees of personal involvement in the attack, the unit officer continues to be fully responsible for the identified tasks assigned to the Command function. In all cases, the initiative and judgement of the officer are of great importance. The modes identified are not strict rules, but general guidelines to assist the officer in planning their actions.

Appendix K

BCFD Manual of Procedure Policy Fireground Operations Engine – Truck



MANUAL OF PROCEDURE

DETAIL PROCEDURE

SECTION

EMERGENCY SERVICES

SUBJECT

FIREGROUND OPERATIONS STANDARD OPERATING PROCEDURE- ENGINE

SCOPE

In order to provide an organized attack for general fire fighting, a standard operating procedure will be used. Fire fighting units must respond and be positioned so that an effective initial attack can be made on the fire. The initial attack position becomes the base from which the fireground commander must operate and can contribute to the success of the operation. The optimum use of communications, apparatus, and water supply by the first alarm units will help assure an efficient operation.

These basic procedures are designed to establish a uniform method of operating at fires and emergencies. They are designed to make the most efficient use of personnel, equipment, and other resources. It is the responsibility of each member to exercise the appropriate control dictated by their rank in the implementation of these operating procedures.

The ranking officer of the first units arriving on the fire scene shall assume command until the arrival of a superior officer and should assess the fireground conditions to determine the extent of the fire or the emergency. Situations may occur that are not covered by any written procedure; and if conditions prevail that would dictate some special action to control or minimize the emergency, the ranking officer should use good judgement and initiate such actions.

PRIMARY FUNCTIONS

- a. To establish an adequate and effective water supply.
- b. To use the appropriate size hose and hose nozzle to control the fire with the least amount of damage.
- c. To prevent fire extension within the fire building or area of origin, particularly where rescue of trapped occupants are concerned.
- d. To prevent fire spread to other exposures.
- e. To confine, control, and to extinguish the fire.

The above functions are not necessarily listed in any order of importance, but are only provided as a partial guide to primary concern. Depending on the structure involved and the nature of the incident, there could be many others. The unit officer will be responsible for setting functional priorities based on observations.

SECTION

EMERGENCY SERVICES

SUBJECT

FIREGROUND OPERATIONS
STANDARD OPERATING PROCEDURE
ENGINESTANDARD OPERATING PROCEDURESFIRST ENGINE

In the absence of a pre-fire plan and/or fireground conditions requiring immediate actions (rescue, serious fire extension, etc.), the first engine company shall lead off from a hydrant and initiate the proper fire fighting tactics by establishing a water supply to the fire scene and attacking the fire with the appropriate size hose stream.

The position of the first-assigned engine will generally be at the front (Side Alpha) of the building. However, if conditions dictate a change in this primary location, other responding units must be immediately notified by radio **[MOP 602]**.

It is preferable to lay large diameter (5") supply hose over single or double 3" supply hose. When possible, the unit officer of the first arriving Engine Company shall lay 5" hose to allow for large stream use. This practice is especially critical where a large volume of fire is evident or the construction or occupancies of the structure(s) involved and/or threatened have the potential to escalate into a large volume of fire; when access is limited, such as on dead-end streets; and when response times for other units might be extended. When laying double supply lines or when positioning Engines at large or potentially large fires, relay operations using siamese fittings to allow for additional incoming lines must be employed.

The apparatus should be positioned so as not to interfere with the movement of other apparatus, nor block the operations of truck companies, if possible. APPARATUS SHALL NOT BE POSITIONED WHERE IT WILL BE ENDANGERED BY EXPOSURE TO EXTREME HEAT, WALL COLLAPSE, ETC. When arriving at the fire scene, a status report will be given including a brief description of tactic being employed and location of hydrant being used. A Rapid Intervention Crew will be established per **[MOP 602-8]**.

THIRD ENGINE

Lead off from a hydrant and establish its own water supply to the fire scene at the opposite exposure, operating per the procedures of the first engine.

Consider the position of the first engine personnel and use caution not to endanger that unit.

The officer of the third engine will give a brief description of tactic employed and hydrant being used and also report on any unusual conditions found at their location.

SECOND AND FOURTH ENGINES

On the first alarm assignment the second engine will cover the hydrant of the first engine and the fourth engine will cover the hydrant of the third engine and be prepared to augment the water supplies. The unit officers of the second and fourth engines will immediately determine that the hydrants they are covering are operating properly. If a hydrant is not operating properly, unit will immediately proceed to augment their water supply, even if seeking another hydrant is necessary. If it is apparent that additional supply lines will be needed to augment the water supply, the above units will lay such additional lines to the first or third engines at the fire scene.

SECTION EMERGENCY SERVICES	SUBJECT FIREGROUND OPERATIONS STANDARD OPERATING PROCEDURE ENGINE
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Once an adequate water supply is assured, the unit officers and members will report to the location of the first and third engine companies [MOP 602-8].

When 3" hose is used, engine companies will hook up to respective hydrant at working fires and be prepared to pump hydrant if the need arises. The need to pump a hydrant where a 5" line is used will be determined on a case by case basis.

All engines responding on additional alarms shall stage as per the level of staging in effect at the time, per [MOP 602].

When ordered to supply ladder pipes or water towers, engines will lead off from a hydrant with 5" hose and position pumper within 100' of the unit to be supplied and set up for relay operations. Lay two 3" lines to appliance being supplied. A second pumper will connect to the hydrant to augment the water supply and lead additional lines where necessary.

The availability of the water supply will determine whether additional lines may be used from pumpers supplying monitors, ladder pipes, or tower-type apparatus.

Except where responding units are in close proximity to the reported location or where delays are encountered, the assignment of units will be in order of their dispatch. Any deviation from assignments will be coordinated by radio.

STANDPIPE OPERATIONS

In the event of a fire in a building equipped with a standpipe and an outside siamese connection and for which no plan of action has been developed, the following operations will be used:

- The first engine shall lead off with 5" hose, position pumper near the building, and set up for relay operations using relay siamese. Lay two 3" lines to siamese connection.
- The third engine shall lead off from a hydrant and cover opposite exposure, report location of hydrant being used. Position pumper and set up for relay operations following procedures of first engine.
- Second and fourth engines will cover the hydrant of the first and third engines and be prepared to augment their water supply. The unit officer and members will report to the location of the first and third engines.
- The personnel of the first and third engine companies shall each take two rolled sections of 1¾" or 2½" hose or high-rise pack, hose nozzle, breathing apparatus, and necessary equipment and proceed to floor of fire or floor below fire, whichever is tenable, to operate from standpipe system.
- A Rapid Intervention Crew will be established on the floor below the fire.

SECTION

EMERGENCY SERVICES

SUBJECT

FIREGROUND OPERATIONS
STANDARD OPERATING PROCEDURE
ENGINESPRINKLER SYSTEM OPERATIONS

In the event of a fire in a building equipped with a sprinkler system and an outside siamese connection, but no standpipe, and for which no plan of action has been developed, the fireground commander will designate the engine to supply the sprinkler system.

If a fire occurs in a building equipped with a sprinkler system and a standpipe system, operations will be performed per procedures governing standpipe systems; and the fireground commander will designate which engine will supply the sprinkler system.

Engines that are ordered to supply sprinkler systems will lead off from a hydrant with 5" hose, position apparatus at building using siamese connection. Lay two 3" lines to siamese connection. Sprinkler systems shall be supplied with at least 150-pounds of engine pressure.

ENGINE COMPANY OPERATIONS - GENERAL

Unit commanders shall remain near nozzles to direct members; regulate the size, force, and direction of streams; and prevent unnecessary damage. Nozzles should not be left unattended while the line is under pressure except in emergencies. Officers should be aggressive in their actions, consistent with safe practices. When conditions allow, line should be redirected or advanced in order to control fire in the assigned area.

Unit commanders shall report to the division/group supervisor or incident commander when an assigned task is completed.

Appropriate breathing apparatus is to be employed by all personnel entering IDLH or smoke-laden atmospheres.

In taking up hose on the fireground, always lay one side of hose in order to be ready for service.

SECTION	SUBJECT
EMERGENCY SERVICES	FIREGROUND OPERATIONS STANDARD OPERATING PROCEDURE ENGINE

REVIEW OF PRIMARY FUNCTIONS

WATER SUPPLY

The establishment of an adequate water supply cannot be overemphasized, particularly for the initial units arriving on the fire scene. The officers in charge of the first- and third-assigned engine companies must exhibit sound judgment in the selection of hose size when leading off. In short, it is better to error on the side of using too large hose rather than too small. If the lead is 600 feet or less, the normal course of action should be to lead off with 5" hose. Even when the lead is more than 600 feet, a large volume or potential for a large volume of fire would normally dictate the use of 5" hose (lead can be completed by second or fourth engine, as necessary). When the distance from the closest water source is more than 600 feet, and there is no indication of a large volume of fire, 3" hose can be used.

- The first and third engines are to position their apparatus close to the fire to provide for short leads for discharge lines.
- The second and fourth engines are to hook up to the first and third engines' hydrants to augment their water supplies.
- Incident commanders must be cognizant of the normal delays associated with augmenting water supplies by having additional lines laid and should be proactive in immediately ordering additional lines laid when the need for larger volumes of water first becomes evident.

APPROPRIATE HOSE LINES AND NOZZLES

The engine company officer will select the appropriate size hose line to attack the fire.

A 1¾" hose line is adequate for dwellings where a fast interior attack is desired.

Where a fire has gained considerable headway and the cooling effect of large volumes of water is required, 2½" attack lines should be placed in service immediately as initial attack lines.

SECTION EMERGENCY SERVICES	SUBJECT FIREGROUND OPERATIONS STANDARD OPERATING PROCEDURE ENGINE
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PREVENTING FIRE EXTENSION WITHIN THE FIRE BUILDING

Hose lines should be placed:

- a) to prevent fire spread and confine the fire to the smallest portion of the building as possible via an interior attack.
- b) between the fire and any occupants that may be trapped or evacuating the building.
- c) well ahead of the fire in openings in cocklofts, plenums, partitions and ceilings to control spreading fires.
- d) to control the vertical spread of fire via shafts, stairwells, ducts and pipe chases.
- e) at the head of the interior basement stairways to check the vertical extension of basement fires.

FIRE SPREAD TO EXPOSURES

Where fires have advanced to the extent that adjacent property is endangered, the primary concern must be to cover the exposures with master streams to cool down exposed surfaces. When a structure is fully involved, the major concentration of hose streams should be on exposures.

CONFINE - CONTROL - EXTINGUISH

After all the previous functions or priorities have been provided for, the final operation is extinguishment. On a large operation, this means reducing to a 1¾" hose lines. Final extinguishment is performed as part of and in conjunction with overhauling – [MOP 606-1].

Related procedures: PREVENTION OF CONTAMINATION OF DOMESTIC WATER SUPPLY [MOP 603-4]



MANUAL OF PROCEDURE

DETAIL PROCEDURE

SECTION

EMERGENCY SERVICES

SUBJECT

FIREGROUND OPERATIONS
STANDARD OPERATING PROCEDURE
TRUCK

SCOPE:

The concept of the truck company as that of a rescue unit is a dominant feature of truck function. In actual practice, the truck role is much more complex. The objective of this procedure is to identify truck company function as follows:

- a. To promote and maximize uniformity of truck operations on the fireground.
- b. To clearly define primary and secondary truck function(s).
- c. To identify areas of truck responsibility (i.e., assignments, sectors).

While it is recognized that all situations cannot be anticipated, the unit officer should attempt to follow this procedure as closely as the particular emergency situation will permit. The unit officer should also use sound judgment in exercising responsibility as to assigning personnel and in completing the unit's assignment.

Truck personnel on single alarm assignments spend an inordinate amount of time out of direct supervisory control. This requires that all personnel be well versed in the areas of primary and secondary concern and are fully capable of performing in different areas (sectors) simultaneously. The unit officer must play an active role in the efforts necessary to bring about a successful conclusion to all emergency situations.

SECTORS:

Sectors shall be defined as those areas in and around the fire or emergency scene where specific work assignments must be completed by fire fighting personnel.

PRIMARY FUNCTION: (Initial fire attack)

To provide:

- a. search and rescue efforts for trapped occupants
- b. controlled ventilation and shut off utilities which may be hampering fire fighting efforts

SECTION EMERGENCY SERVICES	SUBJECT FIREGROUND OPERATIONS STANDARD OPERATING PROCEDURE - TRUCK
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- c access for engine personnel to the seat of the fire
- d ladders for above grade assignments
- e tools and manpower to uncover hidden fire
- f protection for unaffected properties through salvage efforts.

The above listed operations are only a partial guide to primary concerns. Depending on the structure involved and the nature of the incident, there could be many others. The unit officer will be responsible for setting functional priorities based on observations on arrival and during the incident.

Positioning of apparatus should not interfere with movement of other apparatus where possible. **APPARATUS SHALL NOT BE POSITIONED WHERE IT WILL BE ENDANGERED BY EXPOSURE TO EXTREME HEAT, WALL COLLAPSE, ETC.**

STANDARD OPERATING PROCEDURES:

FIRST TRUCK (Order of Dispatch)

Position apparatus as required to facilitate unit operations at the fire building. The first truck will generally be at the front of the building. Should conditions dictate a change in this primary location, other responding units must be immediately notified via radio on the designated fireground talkgroup.

In positioning apparatus, consideration must be given to allow for possible aerial ladder or ladder pipe operations. Purpose and sector assignment will be the determining factor in the selection and placement of portable ladders.

SECOND TRUCK (Order of dispatch)

Position apparatus as required in order to facilitate unit operations at the opposite exposure of the fire building and perform as above. (First Truck)

ADDITIONAL TRUCK UNITS:

If specific instructions have not been received to the contrary, additional truck units will stage as per the level of staging in effect at the time [MOP 602, and 602-8].

STANDARD OPERATING ASSIGNMENTS:

Good training and practice will insure that all personnel understand the various truck assignments. When work assignments are altered for any reason, all personnel must be made aware of the changes in advance of any emergency incident. On any structure fire, the identifiable sectors shall be the habitable areas within the structure (basement, first floor, second floor, etc.) the roof and the exposures. On all large fires of the multi-alarm type it will be the responsibility of the Incident Commander to determine sector assignments.

SECTION	SUBJECT
EMERGENCY SERVICES	FIREGROUND OPERATIONS STANDARD OPERATING PROCEDURE - TRUCK

On single alarm incidents, the fullest advantage must be taken of both truck units in order to provide for immediate coverage of all areas within the involved structure by assigning each a sectored responsibility [MOP 602-8].

TYPICAL TWO (2) AND THREE (3) STORY STRUCTURES:

The most common incidents of fire occur in structures of the two and three story variety. Therefore, structures of this type are cited in the following:

TRUCK ASSIGNMENT - FRONT OF FIRE BUILDING:

EXTERIOR:

- Vertical ventilation (roof) where feasible and practical
- Horizontal ventilation (windows and doors)
- Forcible entry as necessary
- Placement of portable ladders as to need
- Exposures (investigate for fire extension)

INTERIOR:

Second and third floors - Conduct search and rescue. Work with engine personnel by opening up hidden fire.

When investigating for lateral fire extension into adjoining buildings, always work to the right of the fire building - (right being determined while facing the building).

TRUCK ASSIGNMENT - REAR OR OPPOSITE EXPOSURE TO FIRE BUILDING:

EXTERIOR:

- Horizontal ventilation (windows and doors)
- Forcible entry as necessary
- Placement of portable ladders as to need
- Exposures (investigate for fire extension)

SECTION EMERGENCY SERVICES	SUBJECT FIREGROUND OPERATIONS STANDARD OPERATING PROCEDURE - TRUCK
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INTERIOR:

First floor and basement - Conduct search and rescue. Work with engine personnel by opening up hidden fire. Shut off utilities.

When investigating for lateral fire extension into adjoining buildings, always work to the right of the fire building - (right being determined while facing the building).

GENERAL OPERATIONS - FRONT AND REAR ASSIGNMENTS:

Appropriate breathing apparatus and protective clothing must be employed by all members. It should be noted that good practice dictates that members should work in teams of at least two (2) [MOP 602-8].

Members are to move on to other assignments only after conducting a proper search of their initially assigned sector. It is not to be assumed that any area is safe and free of occupants until a proper search has been conducted.

Tools shall be assigned by the unit officer as to need and purpose. The appropriate tools should be employed on the exterior of the structure, **however an axe and ceiling hook SHALL be taken to each interior sector.**

Fire is extremely unpredictable and the situation encountered on arrival will have great influence in determining priorities. When units are deviating from their assignments due to a prevailing situation, the Incident Commander must be notified immediately in order that Command may, if necessary, adjust or alter the plan of attack.

REVIEW OF PRIMARY FUNCTIONS:**SAVING OF LIFE:**

The rescuing of persons in imminent peril takes precedence over all other operations. If occupants are visible on arrival, ladders shall be raised immediately and an all out effort must be made to rescue those occupants. In certain types of structures it may be expedient to utilize the stairway instead of ladders and merely guide the occupants to the floor below the fire or an adjoining safe area. Occupants visible on arrival may be an indication of an even more serious life hazard elsewhere in the building. The absence of visibly distressed occupants shall in no way be regarded as an indication that there is not a serious life hazard [MOP 622-1 SEARCH AND RESCUE].

FORCIBLE ENTRY:

Forcible entry means gaining entrance to a closed or locked area under emergency conditions. Forcible entry should be initiated immediately with the thought in mind as to performing a proper job while causing the least amount of damage. Doors may be opened in many ways, but always try the doorknob first. If a door must be forced, try to force it in a manner that will preserve its integrity if possible.

SECTION EMERGENCY SERVICES	SUBJECT FIREGROUND OPERATIONS STANDARD OPERATING PROCEDURE - TRUCK
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VENTILATION:

Ventilation as it is applied in the fire service means a planned procedure designed to remove smoke, gases and heat from a structure and, if performed effectively, can accomplish several objectives. Proper ventilation will draw fire, heat and smoke away from trapped persons and thus save lives. It will minimize the possibility of backdrafts, reduce fire extension by limiting its lateral spread and mushrooming effect, and make possible the quick location of the seat of the fire. Some of the beneficial side effects of proper ventilation are less physical stress to fire fighters and less water damage to the structure. Ventilation is a vital function in almost every fire fighting situation and requires intelligent decisions as to where and when it should be initiated. Since every building has its own unique ventilation problems, what may be a correct technique in one may not be proper in another. A thorough study of the structures in a unit's inspection district will greatly assist in the decisions necessary in providing proper ventilation.

LADDERING BUILDINGS:

Ladders, both aerial and portable, are significant life saving tools. Removing occupants from buildings via ladders is a difficult and dangerous operation and should be utilized for that purpose only if stairways are untenable.

The aerial ladder is generally used to cover the roof sector, to remove trapped occupants, to gain access and to ventilate if necessary. **Only the Incident Commander will authorize the use of aerial ladder pipes.**

The sector assignment and purpose of operation of the unit shall determine selection and placement of portable ladders.

SEARCH AND RESCUE:

Searching a structure for trapped occupants requires courage and skill and should never be neglected. All areas must be thoroughly searched, particularly those areas subjected to heavy smoke and heat.

If the search of any area has not been completed, the unit officer or the Incident Commander shall be notified in order that a carefully executed follow-up search may be initiated. While searching a building is for the purpose of locating and rescuing trapped occupants, it will also indicate possible points of fire extension.

SECTION EMERGENCY SERVICES	SUBJECT FIREGROUND OPERATIONS STANDARD OPERATING PROCEDURE - TRUCK
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ASSISTING ENGINE PERSONNEL WITH EXTINGUISHMENT:

Assisting engine personnel is not intended to mean taking over engine company function, although at certain types of outdoor fires a truck unit may be ordered to operate hose lines. After performing their function of rescue, ventilation, ladder work, etc., the truck personnel can be a valuable asset to the engine personnel by assisting in their operations. With available tools, truck personnel can open partitions and ceilings in order to facilitate engine companies control and extinguishment of hidden fire. Fast spreading ceiling, cockloft, and attic fires can best be controlled by pulling the ceilings and positioning hose lines well in advance of the fire. This is an excellent example of the combined engine/truck function.

SECONDARY FUNCTION:

After all primary functions have been completed, the truck company will turn its attention to the secondary functions. Some of these functions include, but are not necessarily limited to the following:

- Provide electrical power to the fire scene for lighting etc.
- Remove water to reduce damage and to lessen stress on the building
- Shutting down less important utilities where necessary
- Provide manpower for overhaul
- Provide additional tools for overhaul
- Provide additional protection for salvageable properties
- Secure the building

All of the above listed functions can be collectively considered as part of the general operation known as 'OVERHAUL' [MOP 606-1].

RELATED POLICIES

[MOP 602-8 RAPID INTERVENTION]

[MOP 606-1 OVERHAUL]

[MOP 622-1 SEARCH AND RESCUE]

Appendix L

BCFD Manual of Procedures Fireground Evacuation Plan



**MANUAL
OF
PROCEDURE**

**DETAIL
PROCEDURE**

SECTION

EMERGENCY SERVICES

SUBJECT

FIREGROUND EVACUATION PLAN

PURPOSE

The purpose of the fireground evacuation plan is to provide a notification procedure for firefighters to facilitate rapid and orderly evacuation from a building when conditions deteriorate and the fire building becomes too dangerous for interior operations.

PROCEDURE

When fireground conditions deteriorate and it becomes necessary to withdraw personnel from a building due to unsafe conditions, the following procedure will be implemented:

- The Incident Commander will notify Fire Communications to broadcast an evacuation message as follows:

“All companies operating on Box XXX premises 0000 Cox Street evacuate the building immediately due to unsafe conditions.”

Communications will sound a unique set of tones reserved for **EMERGENCY TRAFFIC** transmissions only, and then will broadcast the message on all talkgroups assigned to that incident.

Or

Command may request Fire Communications to sound the **EMERGENCY TRAFFIC** tones after which Command would broadcast the above message [MOP 515-4].

The above message will be broadcast at least two (2) times on assigned talkgroup.

- When the above command is simulcast, all units on the fireground will sound apparatus air horns simultaneously and continuously for one (1) minute.

Upon hearing the above message and/or air horn warning signal, personnel will immediately withdraw from the building. All equipment should be withdrawn **if possible**.

Immediately after withdrawing from a building, personnel will report to respective Officer so a head count can be completed. The Unit Officer will immediately report any missing personnel to the Incident Commander.

This procedure also applies to incidents other than building fires; e.g., hazmat, building collapse, etc.

RELATED POLICIES

[MOP 622-1] Search and Rescue

[MOP 622-3] Personal Distress Device

[MOP 515-4] Terminology

Appendix M

BCFD Manual of Procedure Shift Safety Officer – Duties



MANUAL OF PROCEDURE

DETAIL PROCEDURE

SECTION

ADMINISTRATION

SUBJECT

SHIFT SAFETY OFFICER- DUTIES

The Shift Safety Officers shall assist the Chief of Safety in the performance of his duties.

Duties - General

Assist the Chief of Safety at the scene of emergencies and in maintaining the administrative function of the Safety and Health Office. [MOP 106-2]

Monitor and assess safety hazards or unsafe situations and develop measures for personnel safety. [Ref. National Fire Academy ISO sm 2-31].

Respond to incidents and report recognized hazards and unsafe operating procedures to the incident commander, and make recommendations for corrections. [Ref. NFPA 1521 2-3].

Conduct investigations of all priority 1, 2 and 4 on-duty injuries/illnesses that involve Fire Department personnel [Ref. NFPA 1521 3-6].

Conduct investigations of collisions involving any Fire Department vehicle with a priority 1 or priority 4 injury to any person. [MOP 119 & NFPA 1521 3-6].

Conduct investigations of all collisions that involve suppression and support service vehicles, regardless of injury.

Maintain liaison with other agencies that respond to fires or emergencies in matters that pertain to safety [MOP 106-2].

Response

The Shift Safety Officer shall respond to emergency incidents that involve a high risk to personnel including but not limited to:

- Working Fires
- Full Rescue Assignments
- Mass Casualty Incidents
- Hazmat Task Force Response
- Dive/Rescue Team / Water Rescue
- Special Rescue Operation Team
- Cave-in / Confined Space

In an effort to promote safe practices and to reduce the personal injury rate of Fire Department personnel, the Shift Safety Officer may report to the scene of other incidents occurring during the tour of duty.

SECTION ADMINISTRATION	SUBJECT SHIFT SAFETY OFFICER- DUTIES
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If a shift safety officer is not available to respond to the scene of an incident and one is needed, the incident commander will designate an acting safety officer.

Duties Specific

Fireground

1. Report to incident commander and obtain briefing.
2. Walk the fireground and establish a fireground perimeter.
3. Survey incidents and personnel for the following:
 - Proper protective clothing and safety gear [MOP 360].
 - Fatigued personnel (heat & cold related problems) [MOP 808-5].
 - Structural conditions (roof, walls, floors, windows, etc.)
 - Utilities (overhead wires, gas lines, LPG tanks, etc.) [MOP 602-2].
 - Safe apparatus placement (collapse zone, properly secured, wheel chocks).
 - Ladders (footing, placement) [MOP 602-2].
 - Operations (opposing hoselines, use of portable master streams, proper equipment use) [MOP 602-1]
 - Rapid intervention team placement [MOP 602-8]
 - Adequate lighting
 - Safe operating procedures [MOP 106-2].
4. Safety Officers shall have the emergency authority to stop or prevent imminent unsafe acts. This action shall be immediately reported to the incident commander. [ref NFPA 1521 2-3].
5. Through the incident commander, insure personnel on the incident are aware of any special circumstances or dangers [ref. National Fire Academy ISO sm 2-3).

Accidents / Injuries

Shall investigate all vehicle collisions involving Fire Department suppression and support service vehicles. [MOP 119 & NFPA 1521 3-6.2].

Shall investigate on-duty Priority 1, 2 and 4 injuries/illnesses involving Fire Department Personnel. [MOP 119 & NFPA 1521 3-6.2].

Shall investigate all burn injuries that occur in the line of duty [NFPA 1521 3-6.2].

Shall prepare and forward a report of investigations to the Chief of Safety. [MOP 106-2].

Shall, when necessary, confiscate equipment used or worn by Fire Department personnel to assist in the investigative process.

SECTION

ADMINISTRATION

SUBJECT

SHIFT SAFETY OFFICER- DUTIES

Administrative

Assist the Chief of Safety, as directed, to maintain the administrative continuity of the Safety and Health Office [MOP 106-2].

Assist with maintaining records pertaining to on-duty injuries/illness and accidents [MOP 106-2].

Assist with maintaining records pertaining to hydrants [MOP 106-2].

Appendix N

BCFD Manual of Procedures Personal Protective Clothing and Equipment



MANUAL OF PROCEDURE

DETAIL PROCEDURE

SECTION

PERSONNEL

SUBJECT

PERSONAL PROTECTIVE CLOTHING AND
EQUIPMENT

THE OFFICIAL PERSONAL PROTECTIVE CLOTHING AND EQUIPMENT OF THE SUPPRESSION FORCE CONSISTS OF THE FOLLOWING:

- Helmet with face shield attached
- Protective fire coat (turnout)
- Protective fire pants (turnout)
- Boots (turnout)
- Protective gloves
- Breathing apparatus and personal facepiece (where applicable)
- Personal Alert Safety System (PASS) and accountability key
- PBI hoods

RESPONSIBILITY OF OFFICER AND MEMBERS

- All Fire Department personnel are prohibited from wearing or using any personal protective clothing or equipment that is not officially issued by the Fire Department, except as specifically set forth below.
- All members who are expected to respond with the apparatus to emergency incidents shall, don turnout coat, turnout pants and turnout boots. Members riding in chief officer vehicles, Pump Operators and Emergency Vehicle Drivers may wear uniform jackets in lieu of turnout coat and shoes in lieu of turnout pants and boots when driving or steering the apparatus.
- When responding to medical assists or other non-hazardous responses, turnout pants, turnout boots and gloves need not be worn, but shall be in member's possession, on the apparatus, in a secure manner, in case of a response to an emergency situation requiring protective clothing.
- All members working at fires or other emergency incidents shall properly wear full protective clothing.
- Face shield, gloves* and other personal protective equipment shall be worn in accordance with good safety standards.
- In hot weather, the Incident Commander may grant permission to remove turnout coats and turnout pants during overhaul operations; however, turnout boots will be worn at all times.

* Gloves may be worn as conditions dictate; however, they shall be worn at all times where there is danger of hand injuries, e.g., during hose and ladder handling and overhaul operations.

SECTION	SUBJECT
PERSONNEL	PERSONAL PROTECTIVE CLOTHING AND EQUIPMENT

- Unit Officers shall be held accountable for the safety of the members of their command and shall enforce Fire Department procedure regarding use of protective clothing and equipment.
- Fire Department protective clothing shall only be worn while on duty. However, during extreme or projected inclement weather, turnout coats and turnout pants and boots may be worn to and from work when the respective Division Chief grants permission. In such cases, an announcement shall be made over the departmental radio system and station printer.

WEARING OF NON-FIRE DEPARTMENT ISSUED PROTECTIVE CLOTHING

Members may wear the following Personal Protective clothing that is currently not issued by the Fire Department:

1. **NFPA-compliant leather fire helmets** - Helmets are ONLY to be of the traditional style, and must meet current NFPA standards for fire helmets.
2. **NFPA-compliant leather "PRO" boots** - Boots that are similar to the current rubber protective turnout boots issued by the Department.

Members wishing to use these non-fire department issued items shall submit a Special Report to the Chief of the Fire Department requesting permission. Special Report will contain all pertinent information about the gear. A manufacturer's specification document verifying the equipment's NFPA compliance will be stapled to the Special Report.

A copy of the Special Report, as well as a copy of the manufacture's specification document will be kept in member's unit file.

PROTECTIVE BREATHING APPARATUS

- Breathing apparatus shall be worn by all members working in smoke-laden or immediately dangerous to life and health (IDLH) atmospheres.
- When permission is granted to remove breathing apparatus on the fireground or other emergency incidents, the breathing apparatus must be returned to respective apparatus immediately for safekeeping.
- When members are injured due to inhalation of smoke or fumes, a thorough investigation shall be made as to the cause. Such incidents shall be properly reported in accordance with [MOP 328 & MOP 441].

SECTION	SUBJECT
PERSONNEL	PERSONAL PROTECTIVE CLOTHING AND EQUIPMENT

EMS PERSONNEL

EMS personnel and members detailed to medic units shall wear the personal protective clothing that has been issued to them when working in proximity of the hazardous areas.

FIREBOAT PERSONNEL

Fireboat personnel who normally work below decks are permitted to wear Fire Department issued jackets. Personnel working below decks in the engine room shall wear hearing protection devices.

STAFF SERVICE PERSONNEL

Staff service personnel shall wear the personal protective clothing and equipment that has been issued to them as required by the nature of work being performed.

ALL OTHER MEMBERS

All other members shall wear personal protective clothing and equipment assigned them or their bureau or division as the situation requires.

Appendix O

BCFD Manual of Procedure Personnel Accountability Report (PAR)



**MANUAL
OF
PROCEDURE**

**DETAIL
PROCEDURE**

SECTION

EMERGENCY SERVICES

SUBJECT

PERSONNEL ACCOUNTABILITY REPORT
(PAR)

Overview

A Personnel Accountability Report (PAR) involves a roll call of all personnel assigned to units and sectors/divisions/groups at an incident. The PAR is a confirmation that all members are accounted for. A PAR will be requested by the Incident Commander, Safety Officer or their designee.

Note: Sector/Division/Group and Unit Officers are to account for personnel under their direction at **ALL** times. This is to be accomplished through radio communications, deployment control and tracking of personnel operating in an IDLH atmosphere.

Examples of situations when a PAR may be requested include:

- Report of a missing or trapped firefighter
- A change from offensive to defensive operations
- A sudden hazardous event at an incident, e.g., flashover, backdraft, building collapse, "mayday" message or explosion.
- At the Incident Commander's discretion.
- Inability to raise a unit by radio
- An unexplained activation of the "Emergency (Red) Button" of the portable radio.

Procedures

Sector/Division/Group and Unit Officers will report their location and PAR to the individual designated by the Incident Commander (i.e., Accountability Officer) on a radio talkgroup designated by the Incident Commander. This Accountability Officer will report results to Command.

When contacted by the Accountability Officer, Sector/Division/Group and Unit Officers will report their Unit's status (i.e., "PAR") and location (e.g., "Side Charlie, 3rd Floor"). If any member cannot be accounted for, the Officer will immediately notify the Accountability Officer or Command and give the person's last known location. No one will begin a search for missing personnel and the RIT Team will not be deployed until specifically ordered to do so by Command.

SECTION

EMERGENCY SERVICES

SUBJECT

PERSONNEL ACCOUNTABILITY REPORT
(PAR)**PAR Radio Communication Examples**

- Command to Safety Officer or designee (i.e., Accountability Officer): "Conduct a Personnel Accountability Report."
- Accountability Officer: "Accountability Officer to Fire Communications, alert units operating on the fireground that a Personnel Accountability Report will be conducted momentarily on (designated talkgroup)."
- Fire Communications: (Evacuation Tones) "All Units operating on Fire Box (box number), you are to give a Personnel Accountability Report and operating location for your Unit (Sector/Division/Group) when called."
- Accountability Officer: "Engine 24"
- Engine 24 OIC: "Engine 24 PAR (i.e., all personnel accounted for), "Located side Alpha 2nd Floor"
- Accountability Officer: "I copy"
- Accountability Officer: "Truck 4"
- Truck 4 OIC: "Truck 4 Portables 1 and 3 PAR Side Charlie 3rd Floor, Portables 2 and 4 PAR on Roof"
- Accountability Officer: "I copy"
- Accountability Officer: "Truck 7"
- Truck 7 OIC: "Truck 7 Portables 1, 2, and 4 PAR Side A, Portable 3 unaccounted for, last known position Side Charlie Roof."
- Accountability Officer: "Accountability Officer to Command, Truck 7 Portable 3 is unaccounted for, last known position Side Charlie Roof."
- Accountability Officer: (Once missing member is located and roll call is completed) "Accountability Officer to Command and Fire Communications, all personnel accounted for."

Appendix P

**BCFD Training Manual – Draeger Breathing
Apparatus, Advancing hose lines and PBI Hoods**



TRAINING MANUAL

SECTION

EQUIPMENT

SUBJECT

DRAEGER BREATHING APPARATUS

I - INTRODUCTION

The Draeger PA-94 Evolution and PA-80 FS self-contained breathing apparatus provide respiratory and eye protection in toxic and oxygen deficient environments. The SCBA (self-contained breathing apparatus) is an open circuit, positive pressure device that allows air to be inhaled from a pressurized cylinder and expelled through an exhalation valve on the facepiece out into the environment. Respiratory protection is enhanced by the positive pressure feature, which creates a higher pressure in the facepiece than exists in the outer environment. Any breach in the integrity of the facepiece seal would cause a leak out of the mask rather than into it. The basic operation of the Draeger unit involves an air cylinder, which contains breathing air in a highly compressed form. With the cylinder valve fully opened, compressed air flows into the first-stage regulator where it is channeled into the medium pressure line at a constant intermediate pressure of approximately 110 psi. It then flows to the second-stage regulator where it is reduced further so that the pressure in the face piece is slightly above ambient pressure. As the user demands air, the second-stage regulator will provide it while also maintaining positive pressure in the facepiece. Expired air escapes into the atmosphere through the exhalation valve on the facepiece.

II - COMPONENTS

A - Cylinder

1. The weight of the 45/60 carbon fiber wrapped aluminum cylinder is approximately 17.6 pounds (fully charged). At full pressurization (4500 psi) it is rated for 60 minutes*.
2. The weight of the 45/45 kevlar wrapped aluminum cylinder is approximately 16 pounds (fully charged). At full pressurization (4500 psi) it is rated for 45 minutes*.
3. Cylinders not in use should be stored with the threaded valve opening pointing downward to prevent debris from entering the valve opening.
4. Cylinders should never be bled completely of air to prevent moisture/condensation from forming inside the cylinder.



SECTION	SUBJECT
EQUIPMENT	DRAEGER BREATHING APPARATUS

- * Cylinder ratings are based on a constant breathing rate of approximately 45-liters/minute. Since a person's breathing rate is dependent on his/her physical conditioning, physical effort and state of mind, the rate of air consumption will differ with each use, and with each individual. On the fireground, it would not be unusual to get considerably less than the rated time of use from either the 45/60 or the 45/45 cylinders.

B - Back Plate

1. **PA-80 FS** - The stainless steel neoprene padded back plate prevents the unit from sliding around on the wearer's back. The back plate also serves as the mounting base for the first-stage regulator.
2. **PA-94 Evolution** - The carbon fiber/nylon composite back plate is designed to provide maximum strength and comfort for the user with minimum weight. The back plate has convenient carrying handles on both sides and is highly chemically resistant (Figure 1).

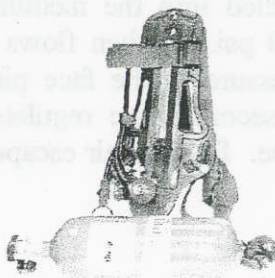


Figure 1

- C - First-stage Regulator** - This unit provides the first reduction in air pressure from the cylinder. The regulator is composed of the following component parts (Figure 2):

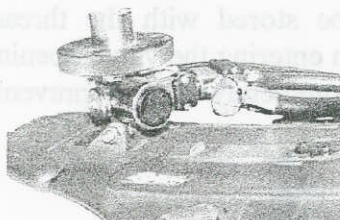


Figure 2

1. Gauge Line

- a. **PA-80 FS** - The black rubber encased, high pressure line registers cylinder pressure at the user's shoulder mounted pressure gauge through the first-stage regulator.

SECTION	SUBJECT
EQUIPMENT	DRAEGER BREATHING APPARATUS

- b. **PA-94 Evolution** - The black rubber encased line delivers high-pressure air to the shoulder mounted pressure mounted whistle. This pressure gauge also has a secondary low-pressure alarm in the form of a flashing gauge. This gauge will flash red at approximately the same pressure that the warning whistle sounds.

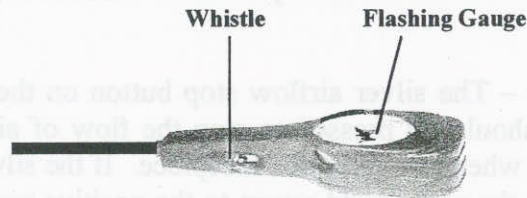


Figure 3

2. **Medium Pressure Line** - This black rubber encased line delivers air at approximately 110 psi from the medium pressure outlet of the first-stage regulator to the second-stage regulator.
3. **Safety Valve** - This factory set valve is designed to open whenever the medium pressure in the first-stage regulator exceeds safe operating pressure. The design is such that it will re-seat itself once the medium pressure recedes to the proper operating level.
4. **Warning Whistle** - This high-decibel warning signal sounds when 23%-27% of a full cylinder's air contents remains. The warning signal sounds between 1035 psi and 1215 psi. The whistle will continue to sound until the air in the cylinder is depleted.
 - a. **PA-80 FS** - The whistle is mounted on the first-stage pressure regulator and has a personal identification feature. When the whistle sounds, the stem of the warning whistle can be depressed resulting in a change of the whistle tone. This change allows the user to immediately identify if their SCBA is in an alarm mode.
 - b. **PA-94 Evolution (Figure 3)** - The whistle is built into the gauge line directly below the pressure gauge. The user can cup their hand over the whistle to determine if their SCBA is in an alarm mode. The user can also check if their SCBA is in an alarm mode by looking at the pressure gauge to see if it is flashing red.

D - Second-stage Regulator - The positive pressure regulator provides air after the first inhalation by the user. It protects the user by maintaining positive pressure within the facepiece. The regulator is attached to the facepiece with a bayonet type connection. After inserting the regulator into the facepiece, it will lock into place with an audible click. To remove the regulator from the face piece, it is first necessary to depress the button on the

SECTION EQUIPMENT	SUBJECT DRAEGER BREATHING APPARATUS
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facepiece connector. A by-pass knob is located on the second-stage regulator. It allows either a quick purge to the mask by pushing in on the by-pass knob and then releasing it, or a continuous flow of air by pushing in the by-pass knob and turning it away from you to the lock position. The positive pressure mode of operation can be triggered by pushing on the center of the second-stage regulator cover. This procedure will also deliver air in the event of by-pass knob malfunction.

1. **PA-80 FS (Figure 4)** – The silver airflow stop button on the face of the second-stage regulator cover should be pressed to stop the flow of air into the facepiece. This should be utilized when removing the facepiece. If the silver button were to be accidentally depressed, the unit would return to the positive pressure mode with the next breath of the user.

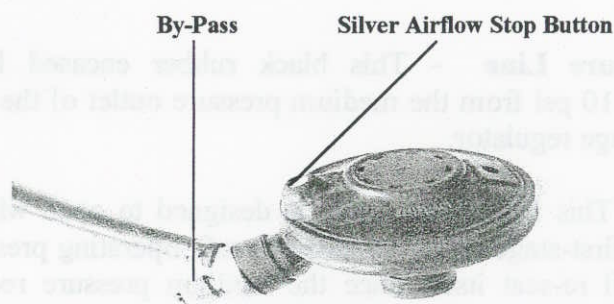


Figure 4

2. **PA-94 Evolution (Figure 5)** – The blue airflow stop button on the top of the second-stage regulator cover should be pressed to stop the flow of air into the facepiece. This should be utilized when removing the facepiece. If the blue button were to be accidentally depressed, the unit would return to the positive pressure mode with the next breath of the user.

Blue Air Flow Stop Button

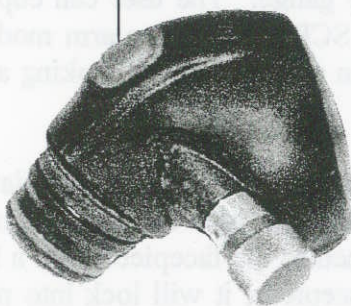


Figure 5

SECTION	SUBJECT
EQUIPMENT	DRAEGER BREATHING APPARATUS

E – Facepiece (Figure 6) - Known as the Panorama Nova, it is a flushing type mask. Compressed air entering the mask sweeps across the lens, thus preventing fogging. In order to keep exhaled air from fogging the lens, a nose cup is provided. Air enters into the nose cup upon inhalation through two valves. Upon exhalation, the two valves close and exhaled air passes directly into the exhalation valve. The nose cup is easily removed for cleaning. The speaking diaphragm is also located within the area of the nose cup. It is recognized by its honeycomb design. The five-point head strap arrangement spider is easily adjusted to fit any user. Each leg of the spider has a quick release feature that allows the straps to easily slide through the buckles.



Gusset

Figure 6

III - PREPARATIONS FOR USE

A - Cylinder to Harness Assembly - Inspect the connecting surfaces of the regulator ball nose o-ring, and the cylinder threads. **The ball nose o-ring should be clean and free of debris.** It is permissible to wipe it with a soft damp cloth. Couple the cylinder valve to the regulator by securing it with the blue/black hand wheel. This is accomplished easier if the cylinder is stood up on a table top or a running board. Support the cylinder by placing the heel of your hand on the rubber cylinder bumper. Pick up the harness with your other hand by placing your fingers through the small holes of the backplate. Bring the back plate close to the cylinder valve so that the fingers of the hand supporting the cylinder can spin the hand wheel. The hand wheel should only be hand tightened. Lay the unit down on the back plate. With the cylinder in position, secure the cylinder strap.

1. **PA-80 FS** - Secure the cylinder strap by attaching the slotted end of the strap into the fastener. The strap is tightened to the cylinder by turning the winged handle on the fastener and then folding the handle flat to lock the ratchet mechanism. **Damage will occur if the cylinder is disconnected from the harness while it is on the user's back. When an air cylinder requires replacement, the member must take the unit off his/her back and disassemble the cylinder from the harness by reversing the above process.**

SECTION	SUBJECT
EQUIPMENT	DRAEGER BREATHING APPARATUS

The cylinder strap can be adjusted by sliding the adjustable half through the guides on the fixed, slotted half. No adjustment is required to the cylinder strap when the 4500 psi/45 minute cylinder is used. The adjustable half will remain in the 45/45 slot of the fixed half. If the use of a 4500 psi/60 minute cylinder becomes necessary, the adjustable half is to be moved to the 45/60 slot in the fixed half. The fixed half of the cylinder strap is not to be removed from the backplate for any reason.

2. **PA-94 Evolution-** Secure the cylinder strap by closing the locking cam and attaching the loose end of the strap to the Velcro fastener. It is important to ensure that the strap passes through the last opening in the locking cam to prevent the accidental release of the cylinder strap. The exact routing of the cylinder strap is embossed on the bottom side of the locking cam. The cylinder strap can be adjusted to fit different size cylinders by sliding more or less strap through the locking cam.

B - Second-stage Regulator to Facepiece Assembly (Figure 7) - The second-stage regulator is attached to the facepiece by aligning it into position and inserting the regulator until a distinctive click is heard. Whenever these components are assembled, the airflow stop button should be depressed to ensure that air doesn't flow from the facepiece until it is donned.

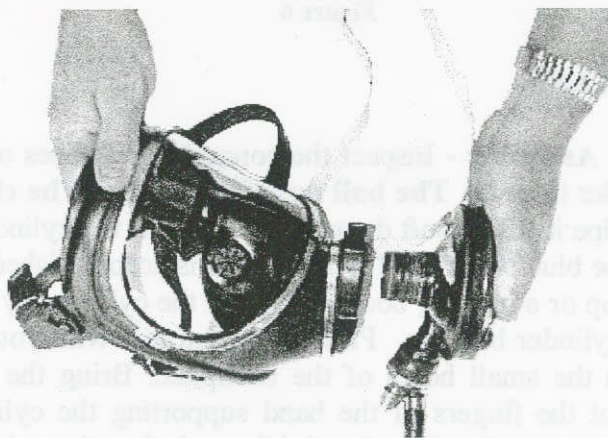


Figure 7

IV - TRAINING

A MINIMUM of 3 hours training per member, per month, on the breathing apparatus must be conducted. This training will be recorded in the Company Daily Record Book (Journal) with the member's name, time and date of training. Members off for an extended period of time will receive this training as soon as they return to duty. Training on the night shift will be conducted, if necessary, to meet this criteria.

SECTION	SUBJECT
EQUIPMENT	DRAEGER BREATHING APPARATUS

V - DONNING

- A - Over-the-Head Method (Figure 8)** - Using both hands, grasp the sides of the backplate with the cylinder valve pointing away from you. Make sure that the shoulder pads, second-stage regulator, and the pressure gauge lines are loose and untangled. Swing the apparatus over the head, making sure that the elbows extend through the loops of webbing, and that the shoulder pads lay squarely on the shoulders. Adjust the shoulder straps and buckle the waist belt.* Tuck the loose ends of the shoulder straps under the waist belt.



Figure 8

*Adjustments on the waist straps can be made by feeding the waist belt webbing through the metal slides on the waist belt. This adjustment should be made by personnel immediately upon the start of a tour of duty.

- B - Coat Method (Figure 9)** - If necessary, straighten the shoulder pads, second-stage regulator, and the pressure gauge lines. Grab the apparatus by both shoulder pads with the backside of the back plate facing towards you and the cylinder valve pointing downward. With the left hand, swing the apparatus onto the right shoulder while extending the right arm through the webbing loop. When the apparatus is on the right shoulder, slip the left arm through the left webbing loop. Adjust the shoulder straps and fasten the waist belt. Tuck the loose ends of the shoulder straps under the waist belt.

SECTION

SUBJECT

EQUIPMENT

DRAEGER BREATHING APPARATUS



Figure 9

C - From the Bracket - Back up to the bracket and put your arms through the shoulder straps. Grasp straps at the shoulder and pull forward. Adjust the shoulder straps and fasten the waist belt. Tuck the loose ends of the shoulder straps under the waist belt.

D - Donning the Facepiece (Figures 10, 11 & 12) - Don the fire hood. Pull the fire hood back over your neck. Place the facepiece neck strap around your neck. Spread the spider with both hands. Place your chin into the mask. Pull the mask onto the face, pulling the spider over your head. Smooth the centerpiece of the spider downward on the back of the head. Tighten the lower straps first, then the temple straps next. Tighten the top strap last if necessary. Therefore, the proper order for tightening the straps is: **chin, temple, top**. When tightening these straps, always be sure that the pull is backward not out to the side. Pull the fire hood back over your head and facepiece. Position the interface of the helmet in the proper position. Place the helmet on your head and tighten the chinstrap.



Figure 10

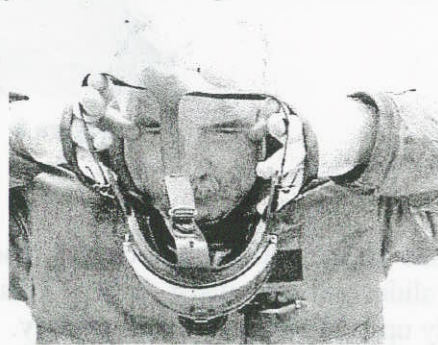


Figure 11

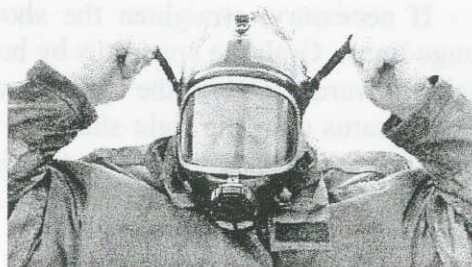


Figure 12

SECTION	SUBJECT
EQUIPMENT	DRAEGER BREATHING APPARATUS

E - OPERATIONS

1. Press and release the airflow stop button.
2. Check that the by-pass knob is not locked in the on position.
3. Open the cylinder valve completely by turning the handle counterclockwise.
4. Don the apparatus as previously described.
5. Don the facepiece with second-stage regulator pre-connected, using the proper technique.
6. Check your by-pass knob to ensure that it is working correctly.
7. Check your shoulder mounted pressure gauge to ensure that it registers the air pressure in your cylinder.
8. Shut down the cylinder valve. While looking at the shoulder mounted pressure gauge, slowly breathe down the air remaining in the airlines. Observe the pressure at which the alarm sounds. This should occur between 1215 psi and 1035 psi. When the air supply is completely depleted, inhale to see if the facepiece collapses on your face. This will indicate that you have a good seal, and will provide a user seal check of the facepiece prior to entering any IDLH atmosphere.*
9. Open cylinder valve completely prior to start of further operations.

* Item 8 can also be accomplished by using the method described in [TM 101-7].

VI - DOFFING

- A - Removing the Facepiece** - Loosen the helmet chinstrap and remove the helmet. Pull fire hood back off of head. Release the facepiece spider straps by pushing forward against the slide buckles. After the straps are loose, momentarily hold your breath. Press the airflow stop button and remove the mask from your head. If the user will continue to work with the unit on their back, it is important to assure that no debris or water enters the facepiece. This can be accomplished by using the small button on the neck strap. By inserting this button into the small hole on the forehead strap of the facepiece, the facepiece opening will rest against the user's chest, thus preventing any possible entry of debris, water, dust, etc., into the facepiece.
- B - Second-stage Regulator Storage Holster** - On the PA 94 Evolution SCBA it is important to store the second-stage regulator, when not connected to the facepiece, by inserting it into the holster on the waist belt. This will **prevent debris from entering the connector of the second-stage regulator**. Utilizing the holster will also **keep the second-stage regulator from swinging free and being crushed in a door**.



TRAINING MANUAL

SECTION

EQUIPMENT

SUBJECT

DRAEGER BREATHING APPARATUS (PA-80 AND PA-94) CLEANING

CLEANING / DISINFECTING THE PA-80 AND PA-94 AS NOTED.

On Fireground

Do not use a hose line to wash dirt and debris from SCBA. Use a damp cloth for this purpose. It is very important to **keep water and debris from entering the first-stage regulator**. It is also very important to **keep debris from entering the second-stage regulator and facepiece**.

In Station After Each Use (Wear Suitable Eye Protection)

1. Prepare a solution of A-33 by mixing 2 oz. of A-33 liquid with one gallon of clean warm water in a clean container. A single compression, on the pump provided, will deliver 1oz. of A-33 liquid. Mix the solution thoroughly. The water should not be so warm that your hands cannot be submerged in it. Several gallons will be required to submerge parts.
2. Disconnect the facepiece from the second-stage regulator.
3. Remove the nose cup from the facepiece.
4. Check inside of the facepiece for debris. If necessary, shake any debris from the facepiece. If a rattling sound is still heard contact Air Mask Repair.
5. On the PA-80 FS SCBA, disconnect the medium pressure line at the quick disconnect fitting. Remove it along with the second-stage regulator by pulling it through the two loops on the shoulder harness.
6. Immerse and manually agitate the facepiece, nose cup, and second-stage regulator in the A-33 solution. On the PA-80 FS SCBA, do not immerse the second-stage regulator hose in the solution to the extent that the solution enters the open end of the hose.
7. Remove the facepiece, nose cup, and second-stage regulator from the A-33 solution. Thoroughly rinse them in a container of clean (clear) warm water. Change this rinse water if it becomes cloudy. Pressurized water should not be used (strong stream from hose or spigot).
8. Thoroughly dry the components by shaking out excess water. Continue drying with soft lint free cloth. Do not insert cloth into openings of the second-stage regulator. Allow components to air dry if possible.
9. Replace the nose cup into the facepiece making certain that it fits around and into the groove of the speech diaphragm.
10. On the PA-80 FS SCBA, reattach the second-stage regulator hose to the SCBA by passing it through the two (2) loops on the shoulder strap and inserting the end of the hose into the quick disconnect fitting.
11. Check operation of the airflow stop button (silver/blue) by pressing down on it. Check manual operation of the second-stage regulator by pressing down on the center of the second-stage regulator cover. **Do not press on both at the same time** or damage will occur to the mechanism inside the second-stage regulator.

SECTION	SUBJECT
EQUIPMENT	DRAEGER BREATHING APPARATUS (PA-80 AND PA-94) CLEANING

12. Clean the harness and back plate with the A-33 solution to remove any dirt and debris. A sponge or rag can be used for this and **care should be taken not to let any water enter the ball-nose connection on the first-stage regulator.**
13. Inspect the second-stage regulator o-ring (orange) for cracks, dirt, missing pieces, and lubrication. If damaged contact Air Mask Repair. If dirty clean with A-33 solution. If dry (not lubricated) apply a very small amount of Molycote 111 to the o-ring (enough to shine the o-ring). Remove any excess lubricant with clean fingers.
14. Pressurize and test the SCBA and facepiece by completing an operations check.

NOTE: Members are at no time to use organic solvents such as acetone, alcohol, white spirit, gasoline, diesel fuel, or similar products to clean or disinfect any part of the SCBA assembly.



TRAINING MANUAL

SECTION

EQUIPMENT

SUBJECT

DRAEGER BREATHING APPARATUS
BUDDY BREATHING

BUDDY BREATHING PA-94 EVOLUTION SCBA

The buddy breather pigtail is located on the left side of the waist belt and is held in place by a webbing loop. This accessory can be used to supply air to, or receive air from, another Fire Fighter in the event of a malfunction of the SCBA.

Emergency Operations - In the event of a malfunction where the air supplied to the facepiece is diminished or completely disrupted, the Fire Fighter should immediately try to re-establish the air supply by using the by-pass knob or pressing on the center of the Lung Demand Valve (LDV) cover. If these procedures fail to provide air to the facepiece, the user may attempt buddy breathing. Total familiarity with this procedure will ensure competence in the event that it must be used. Following the procedure outlined below will ensure that the task is completed quickly and effectively.

All SCBA are provided with a 40" Buddy Breather Hose that is carried in a Nomex pouch on the side of the SCBA frame (Figure 1).

NOTE: It is important to secure the 40" Buddy Breather Hose inside of the pouch with the provided drawstring to prevent loss. The hose may be secured in the pouch with a slipped double overhand knot.



Figure 1

SECTION	SUBJECT
EQUIPMENT	DRAEGER BREATHING APPARATUS BUDDY BREATHING

Buddy Breathing Air Provider

1. Position yourself near the air recipient so that both buddy breather pigtails are accessible.
2. Remove the 40" Buddy Breather Hose from your or the air recipient's pouch.
3. Connect one end of the Buddy Breather Hose to the buddy breather pigtail of the air recipient's SCBA (Figure 2). It is important to hold onto the free end of the Buddy Breather Hose to prevent it from whipping around.
4. Connect the other end of the Buddy Breather Hose to the buddy breather pigtail of your SCBA. **The air recipient or a 3rd Fire Fighter may need to make this connection because of the location of the pigtail.**
5. When the connections have been accomplished, both members are to immediately exit to a safe atmosphere.

Hose Connections - Connections are made by pushing the male end of the Buddy Breather Hose into the female coupling of the buddy breather pigtail. This connection is difficult to accomplish when the medium pressure lines are pressurized. The loss of some air from the end of the Buddy Breather Hose will occur and should be kept to a minimum. This loss of air may be reduced by bending (kinking) the Buddy Breather Hose while the connections are made. These fittings are uncoupled by pushing in the male end of the hose while pulling back on the sleeve of the female coupling. This is most easily done after pressure is bled from the medium pressure lines.

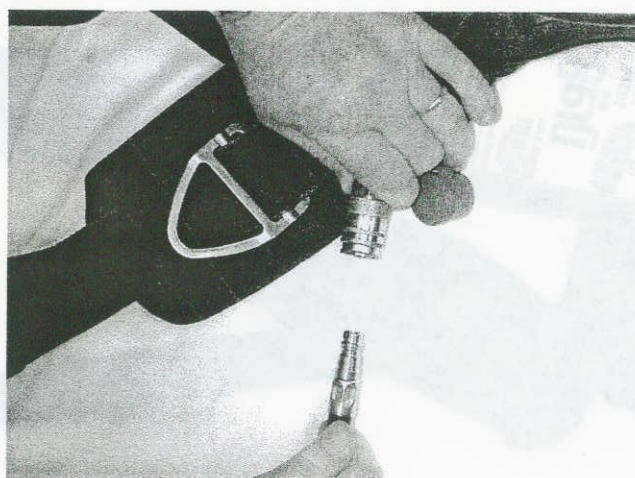


Figure 2

SECTION	SUBJECT
EQUIPMENT	DRAEGER BREATHING APPARATUS BUDDY BREATHING

RESCUE AIR PA-94 EVOLUTION SCBA – Using RIT Bag and 8' Air Line

Rescue Air is a method of providing medium pressure breathing air to another person through their SCBA buddy breather pigtail (Figures 3 & 4). This air can be supplied between two SCBA by using either the 40" Buddy Breather Hose attached to each harness or the Rescue Air Supply carried in the Rapid Intervention Team (RIT) equipment bag. The air is transferred via an 8' air line with male fittings on both ends. The coupling and uncoupling of this airline is the same as outlined in the Buddy Breathing Air Provider instructions.

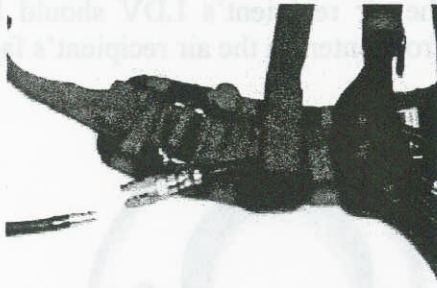


Figure 3

To prevent a loss of air when connecting the Rescue Air Supply to the air recipient, follow the procedure outlined below:

1. Ensure that the cylinder valve is closed on the Rescue Air Supply and that the 8' air line is attached to the quick disconnect on the Rescue Air Supply (Figure 4).
2. Attach the free end of the 8' air line to the buddy breather pigtail on the air recipient's SCBA (Figures 2 and 3).
3. Turn on the cylinder valve of the Rescue Air Supply.



Figure 4

SECTION EQUIPMENT	SUBJECT DRAEGER BREATHING APPARATUS BUDDY BREATHING
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RESCUE AIR PA-94 EVOLUTION SCBA – USING RIT Breathing Recovery Unit (BRU Adapter)

Each RIT Bag contains a BRU Adapter that can be connected to the end of the 8' air line and attached to an air recipient's facepiece. The BRU Adapter consists of a Draeger LDV with a female quick disconnect attached to the end of an 18" hose. This method of providing rescue air can be utilized if the air recipient's buddy breather pigtail is inaccessible or there is a malfunction of the air recipient's SCBA. Exchanging of the air recipient's LDV should be completed as quickly as possible to prevent contaminated air from entering the air recipient's facepiece.

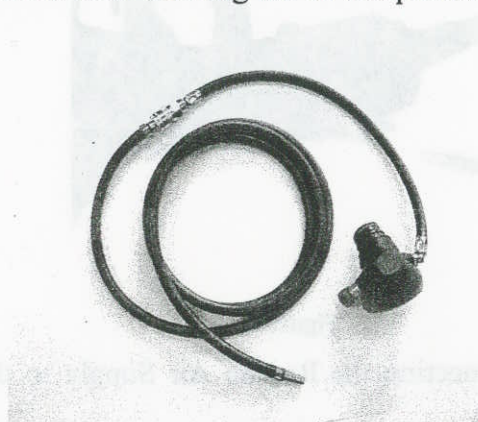


Figure 5

RESCUE AIR PA-94 EVOLUTION SCBA – Using Rescue Pack

Rescue Air can also be supplied to a person trapped for an extended period of time by utilizing the Rescue Pack Supplied Air System (Figure 6). This method of supplying rescue air requires the use of an ALE-Lite Supplied Air Respirator (SAR) carried with every Rescue Pack (See TM 101-4). Employing this method requires that the air recipient's LDV be replaced with the LDV of the ALE-Lite Respirator. As stated previously, the exchange of the LDV's should be completed as quickly as possible to prevent contaminated air from entering the air recipient's facepiece.

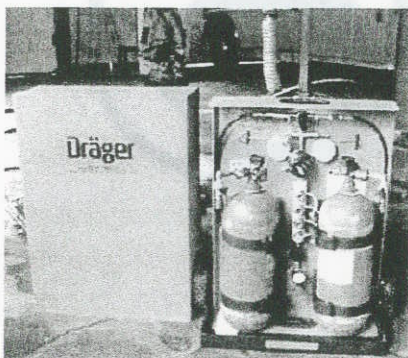


Figure 6



TRAINING MANUAL

SECTION

EQUIPMENT

SUBJECT

DRAEGER BREATHING APPARATUS
INSPECTION

BEGINNING OF EACH SHIFT

Facepiece Inspection

Members are to remove their personal Draeger SCBA facepiece from their lockers at the beginning of each shift.

A visual inspection of the facepiece should be conducted at the beginning and end of each shift.

The member shall check for the following:

1. Overall condition of the facepiece body (checking for holes, small tears, cuts, missing or broken flap studs, clear of debris).
2. Conditions of head strap (all buckles present and operating, pull tabs not torn off, straps fully extended).
3. Condition of neck strap (particularly the small button on the neck strap).
4. Condition of the nose cup and nose cup valves.
5. Condition of the gusset (bent or missing) the gusset **MUST NOT BE UNDER THE LENS FRAME**. The gusset is shown in Figure 6 [TM-101].
6. Condition of lens (clean and free of cracks).
7. Condition of exhalation valve cover (screen not pushed in).

On the first day of day shift, the unit officer will inspect the facepieces of all members on duty. The unit officer will note inspection on the Watch Desk Record form (28-2100-0080).

Members are to immediately report any problems to their unit officer. Spare facepieces are carried on each air cascade unit for use as loaners.

SCBA Inspection

Upon completion of facepiece inspection members are to proceed with inspection of SCBA assigned to their position on apparatus.

Inspection of SCBA shall consist of the following:

1. Visually inspect the orange o-ring on second-stage regulator bayonet fitting for damage, dirt and lubrication. If dry (not lubricated) apply a very small amount of Molycote 111 to the o-ring (enough to shine the o-ring).

SECTION	SUBJECT
EQUIPMENT	DRAEGER BREATHING APPARATUS INSPECTION

2. Check that the by-pass knob is not locked opened and depress the airflow stop button.
3. Open the cylinder valve and check the pressure reading on the cylinder valve gauge and shoulder strap gauge. The cylinder should be fully charged.
4. Check for a leak by closing the cylinder valve and watching the shoulder strap gauge. The needle of the gauge should not drop more than 1000 psi in one (1) MINUTE. Movement of the gauge needle greater than 1000 psi shall be reported to Air Mask Repair personnel. If slight or no leakage is indicated, open the cylinder valve and proceed to next step.
5. Check to see that the unit will trigger into positive pressure by depressing the center of the second-stage regulator. A large volume of air should flow out of the bayonet fitting. Stop the airflow by pushing in on the airflow stop button. **Do not allow the air to flow for more than a second.**
6. Close the cylinder valve. Cup your hand tightly over the bayonet fitting of the second-stage regulator. Trigger the unit into positive pressure by depressing the center of the face of the second-stage regulator. Slowly allow air to escape past your cupped hand while you watch the needle on the shoulder strap gauge. Note the pressure at which the warning whistles sounds. The whistle should sound when the pressure reaches approximately 1215 psi - 1035 psi. The flashing gauge on the PA-94 Evolution should flash red at approximately the same time that the whistle sounds.
7. Check that all straps are properly adjusted, clean, and ready for immediate use.
8. Check that the SCBA frame is clean and ready for use.

All members and Unit Officers will confirm their SCBA change of shift inspections by signing the watch desk record to that effect.

END OF EACH SHIFT

1. Members are to clean and sanitize their facepieces after each use with A-33 solution or Draeger alcohol free wipes only. Rinse the facepiece in clean/clear water after cleaning and sanitizing.
2. Members are to inspect their facepieces after each shift and after each use, prior to storage, so that any problems can be taken care of before the start of the next shift.



TRAINING MANUAL

SECTION

EQUIPMENT

SUBJECT

ALTERNATIVE DRAEGER FACEPIECE USER
SEAL CHECK

DRAEGER FACEPIECE USER SEAL CHECK

Purpose: To ensure that the member has a proper seal on their facepiece prior to entering an IDLH atmosphere.

Responsibility: Member will conduct a user seal check in accordance with this instruction and or [TM-101] every time prior to use of the facepiece.

Test Procedures:

1. Conduct user seal check in accordance with [TM-101].
2. An alternative method of completing a user seal check is outlined below:
 - A. Don SCBA as outlined in [TM-101] donning.
 - B. Don facepiece separately as outlined in [TM-101] donning.
3. Using the left hand bring the second-stage regulator up to the facepiece and at the same time place the right hand on the cylinder valve hand wheel.
4. Insert the second-stage regulator into the facepiece with the left hand until it locks into connecting piece (a click sound will be heard).
5. Immediately inhale and notice that the facepiece begins to collapse against the face.
6. Immediately after noticing the facepiece collapse turn the cylinder valve on with the right hand.
7. If the facepiece did not collapse against the face turn the cylinder valve off, remove the facepiece, disconnect the second-stage regulator, and reposition the facepiece on your head.
8. Repeat the above procedure until the facepiece collapses against the face indicating a proper seal.

Never enter an IDLH (Immediately Dangerous to Life or Health) atmosphere unless you have completed a successful user seal check of your facepiece.

SECTION	SUBJECT
EVOLUTIONS	ADVANCING HOSELINES

PURPOSE

To effectively attack and extinguish a fire, hoselines must be removed from the apparatus and stretched toward the fire. There are a variety of hose lays in use and they are dictated by the type of apparatus being used. At present hose compartments are set up several different ways:

1. Newer Apparatus (Post-1984)
 - A. A hose bed for 1200' of 3" hose normally used as supply line.
 - B. A hose bed for 250' of 2 ½" hose preconnected.
 - C. Two beds for 1 ¾" attack hose.
2. Newer apparatus equipped with large diameter hose
 - A. A hose bed for 600' of 5" supply hose.
 - B. A hose bed for 1200' of 3" supply hose.
 - C. A hose bed for 250' of 2 ½" hose preconnected.
 - D. Two beds for 1 ¾" attack hose.

PROCEDURE

Preconnected lines, whether 1 ¾" or 2 ½" in diameter, are loaded in what is known as a "flat load", with the nozzle of top, or in what is known as a "minuteman load", where the nozzle is on the bottom. With the "flat load", the fire fighter assigned to the nozzle takes the nozzle and one or more folds of hose and simply drags them to the point of operation. In the "minuteman load", the fire fighter assigned the nozzle takes a position on either side of the pumper's crosslay or at the rear of the hosebed, depending on the pumper. Another member pulls the whole load onto the fire fighter's shoulder. As the fire fighter walks away from the pumper, the hose lays out from the fire fighter's shoulder.

SECTION	SUBJECT
EVOLUTIONS	ADVANCING HOSELINES

EVOLUTION # 219**ADVANCE A PRECONNECTED LINE OF 1 ¾" HOSE INTO A BUILDING USING THE MINUTEMAN LOAD****PERSONNEL REQUIRED: 2****EQUIPMENT: Pumper, line of 1 ¾" hose and nozzle.****OPERATION****Fire Fighter**

1. Position self at hose bed where officer will place the minuteman load on your shoulder.
2. Proceed into the building to the necessary floor.
3. Operate nozzle and advance line as directed.

Officer

1. Pull minuteman load from hosebed and place on fire fighter's shoulder.
2. Follow fire fighter into building, straightening hose as needed.
3. Direct operation of hoseline, assisting as required.
4. Maintain communications with command.



Training Manual

TM 102-2

SECTION

Equipment

SUBJECT

PBI Hoods

ISSUE AND USE

Polybenzimidazole (PBI) hoods that meet the requirements of NFPA 1971 are being issued to all fire suppression personnel. The PBI Hood will be included as part of each member's personal protective clothing as per MOP 360-1 and WILL BE WORN ANY TIME THAT MEMBERS ARE REQUIRED TO WEAR SCBA. The PBI hood may also be worn for additional protection at incidents when worn in conjunction with personal protective clothing including the turnout coat and fire helmet.

DONNING THE HOOD

The PBI hood will be pulled on before donning the turnout coat and may be pushed back on the neck until needed. After the SCBA face piece is donned, the PBI hood will be pulled forward, up and over the back of the head so that it covers the mask straps. The PBI hood should form a protective seal around the SCBA face piece.

Members will abide by the following guidelines when wearing the PBI hoods:

1. The hood must always be worn over the straps of the SCBA face piece and be pulled forward to cover all exposed skin.
2. The hood is to be tucked inside the collar of the turnout coat.
3. To enable the hood to provide the maximum protection member must comply with the following:
 - a. the turnout coat must be fastened all the way to the top
 - b. the turnout coat collar must be pulled up
 - c. the ear flaps of the helmet must be pulled down over the hood

CARE AND WASHING

The hood is to be cared for and cleaned as per the instructions on the label of each hood. The label must not be removed from the hood. The hood must be kept clean as soiling will reduce its protective qualities. The hood must not be tumble dried, as it may shrink and not fit properly. After washing, it is to be shaped and allowed to air dry on a towel. It is important that the hood not be exposed to chlorine bleach which will significantly compromise the protection provided by the hood. The hood must not be stored in direct sunlight.

DAMAGED HOODS

Care is to be taken so that hoods are not stretched out of shape or needlessly damaged in any way. Hoods that have stretched and no longer fit properly or that have been damaged will be inspected by respective Battalion Chief and replaced as per MOP 363-5.

Appendix Q

NFPA Standards 1500 and 1561

NFPA 1500

Standard on

Fire Department Occupational Safety and Health Program

2002 Edition

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This edition of NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, was prepared by the Technical Committee on Fire Service Occupational Safety and acted on by NFPA at its November Association Technical Meeting held November 10–14, 2001, in Dallas, TX. It was issued by the Standards Council on January 11, 2002, with an effective date of January 31, 2002, and supersedes all previous editions.

This edition of NFPA 1500 was approved as an American National Standard on January 31, 2002.

Origin and Development of NFPA 1500

This is the fourth edition of this standard. Previous editions were published in 1987, 1992, and 1997. The technical committee, working from data provided from NFPA's Data Analysis and Research Division, NFPA Fire Investigation reports, and NIOSH Fire Fighter Investigation reports, has updated requirements and explanatory text.

The number of fire fighter fatalities and injuries in the United States continues to make this occupation one of the most dangerous. Emphasis on medical and physical fitness capabilities, the use of incident management, and communication issues continue to dominate the statistics. This standard continues to emphasize these areas, as well as provides updates to the requirements and references to other standards. These include other referenced NFPA standards in the areas of personal protective clothing and equipment, fire apparatus, training, medical requirements, and other areas.

One of the most important areas of fire fighter safety, addressed in this revision, is respiratory protection. There are numerous NFPA standards, NIOSH regulations, CGA standards, and other publications that address this area. The technical committee, working in conjunction with other committees, has developed a complete section that sets the requirements for a fire department complete respiratory protection program. It provides the user, as well as the enforcer, of the standard one source in which to find and implement their respiratory protection program.

The technical committee can continue to develop and revise standards, but there must be a fundamental behavioral change in how fire fighters and fire departments address fire service occupational safety. In turn, they must continue to educate their members and, most importantly, the administration and citizens to what the hazards are of the fire fighting profession. The utilization and implementation of this standard can go a long way in reducing the staggering statistics involving fire fighter fatalities and injuries, but only if given the training and resources to do so.

In Memoriam, September 11, 2001

We pay tribute to the 343 members of FDNY who gave their lives to save civilian victims on September 11, 2001, at the World Trade Center. They are true American heroes in death, but they were also American heroes

in life. We will keep them in our memory and in our hearts. They are the embodiment of courage, bravery, and dedication. May they rest in peace.

Technical Committee on Fire Service Occupational Safety

John A. Sharry, *Chair*

Lawrence Livermore National Laboratory, CA [E]

Donald Aldridge, Lion Apparel, Inc., OH [M]

Glenn P. Benarick, Fairfax County Fire Department, VA [U]
Rep. NFPA Fire Service Section

Mary S. Bogucki, Yale University, CT [SE]

Angelo M. Catalano, New York State Association of Fire Districts, NY [U]
Rep. Association of Fire Districts/State of New York

Dennis R. Childress, Orange County Fire Authority, CA [U]

Bradd K. Clark, Sand Springs Fire Department, OK [U]
Rep. International Fire Service Training Association

Dominic J. Colletti, Hale Products, Inc., PA [M]

Scott L. Davidson, Volunteer Firemen's Insurance Services, Inc. (VFIS), PA [I]

Philip J. Eckhardt, Mine Safety Appliances Co., PA [M]
Rep. Industrial Safety Equipment Association

Kenneth R. Ethridge, Texas Commission on Fire Protection, TX [E]

Don R. Forrest, United Firefighters of Los Angeles City, CA [L]
Rep. International Association of Fire Fighters

James C. Goodbread, U.S. Air Force, OK [U]

Curt T. Grieve, Sacramento, CA [SE]

Thomas A. Hillenbrand, Underwriters Laboratories Inc., IL [RT]

Jonathan D. Kipp, Primex3, NH [I]

Buck Latapie, USDA Forest Service, DC [E]

John LeCuyer, Aurora Fire Department, CO [L]

George L. Maier III, New York City Fire Department, NY [U]

Richard A. Marinucci, Farmington Hills Fire Department, MI [E]
Rep. International Association of Fire Chiefs

Roger A. McGary, Montgomery County Division of Fire & Rescue Services, MD [U]
Rep. International Society of Fire Service Instructors

Robert D. Neamy, Los Angeles City Fire Department, CA [U]

William E. Perrin, Montana Fire Training School, MT [SE]
Rep. National Association of State Directors of Fire Training and Education

Neil Rossman, Rossman, Rossman & Eschelbacher, MA [SE]

Philip C. Stittleburg, LaFarge Fire Department, WI [U]
Rep. National Volunteer Fire Council

Grace Yamane, San Diego Fire and Life Safety Services, CA [L]

Alternates

Patricia L. Doler, Santa Clara County Fire Protection District, CA [L]
(Alt. to G. Yamane)

Craig A. Fry, Los Angeles City Fire Department, CA [U]
(Alt. to R. D. Neamy)

Terry G. Glunt, U.S. Fire Administration, MD [SE]
(Vot. Alt. to USFA Rep.)

James E. Johannessen, Underwriters Laboratories Inc., PA [RT]
(Alt. to T. A. Hillenbrand)

Scott D. Kerwood, Orange County Emergency Services District #1, TX [E]
(Alt. to R. A. Marinucci)

Murrey E. Loflin, Virginia Beach Fire Department, VA [U]
(Alt. to G. P. Benarick)

David A. Love, Jr., Volunteer Firemen's Insurance Services, Inc. (VFIS), PA [I]
(Alt. to S. L. Davidson)

Daniel J. Martinelli, Aurora Fire Department, CO [L]
(Alt. to J. LeCuyer)

Ron C. Miller, Fairbank, IA [U]
(Alt. to P. C. Stittleburg)

Gary L. Neilson, Reno Fire Department, NV [E]
(Vot. Alt. to FDSOA Rep.)

William E. Newcomb, TFG/North Safety Products, RI [M]
(Alt. to P. J. Eckhardt)

Stephen E. Norris, United Firefighters of Los Angeles City, CA [L]
(Alt. to D. R. Forrest)

Richard S. Pike, Wantagh Fire District, NY [U]
(Alt. to A. M. Catalano)

Andrew E. Pompe, Lion Apparel, Inc., PA [M]
(Alt. to D. Aldridge)

Joseph F. Williams, Weldon Technologies, Inc., [M]
(Alt. to D. J. Colletti)

Stephen N. Foley, NFPA Staff Liaison

Committee Scope: This Committee shall have primary responsibility for documents on occupational safety in the working environment of the fire service; and safety in the proper use of fire department vehicles, tools, equipment, protective clothing and protective breathing apparatus.

This list represents the membership at the time the Committee was balloted on the final text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the back of the document.

NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

7.2 Protective Clothing for Structural Fire Fighting.

7.2.1* Members who engage in or are exposed to the hazards of structural fire fighting shall be provided with and shall use a protective ensemble that shall meet the applicable requirements of NFPA 1971, *Standard on*

Protective Ensemble for Structural Fire Fighting.

7.2.2* The protective coat and the protective trousers shall have at least a 5.08-cm (2-in.) overlap of all layers so there is no gaping of the total thermal protection when the protective garments are worn.

7.2.2.1 The minimum overlap shall be determined by measuring the garments on the wearer, without SCBA, in both of the following positions:

- (1) Position A. Standing, hands together reaching overhead as high as possible
- (2) Position B. Standing, hands together reaching overhead, with body bent forward at a 90 degree angle, to the side (either left or right), and to the back

7.2.3 Single-piece protective coveralls shall not be required to have an overlap of all layers provided there is continuous composite protection.

7.2.4 Fire departments that provide protective coats with protective resilient wristlets secured through a thumb opening shall be permitted to provide gloves of the gauntlet type for use with these protective coats. Fire departments that do not provide such wristlets attached to all protective coats shall provide gloves of the wristlet type for use with these protective coats.

7.2.5 Protective clothing and protective equipment shall be used and maintained in accordance with manufacturers' instructions.

7.2.5.1 The fire department shall establish a maintenance and inspection program for protective clothing and protective equipment.

7.2.5.2 Specific responsibilities shall be assigned for inspection and maintenance.

7.2.6 The fire department shall require all members to wear all the protective ensemble specific to the operation as required in Chapter 8.

Chapter 8 Emergency Operations

8.1 Incident Management.

8.1.1 Emergency operations and other situations that pose similar hazards, including but not limited to training exercises, shall be conducted in a manner that recognizes hazards and prevents accidents and injuries.

8.1.2 An incident management system that meets the requirements of NFPA 1561, *Standard on Emergency Services Incident Management System*, shall be established with written standard operating procedures applying to all members involved in emergency operations.

8.1.3 The incident management system shall be utilized at all emergency incidents.

8.1.4 The incident management system shall be applied to drills, exercises, and other situations that involve hazards similar to those encountered at actual emergency incidents and to simulated incidents that are conducted for training and familiarization purposes.

8.1.5* At an emergency incident, the incident commander shall be responsible for the overall management of the incident and the safety of all members involved at the scene.

8.1.6 As incidents escalate in size and complexity, the incident commander shall divide the incident into tactical-level management components and assign an incident safety officer to assess the incident scene for hazards or potential hazards.

8.1.7 At an emergency incident, the incident commander shall establish an organization with sufficient supervisory personnel to control the position and function of all members operating at the scene and to ensure that safety requirements are satisfied.

8.1.8* At an emergency incident, the incident commander shall have the responsibility for the following:

- (1) Arrive on-scene before assuming command.
- (2) Assume and confirm command of an incident and take an effective command position.
- (3) Perform situation evaluation that includes risk assessment.
- (4) Initiate, maintain, and control incident communications.
- (5) Develop an overall strategy and an incident action plan and assign companies and members consistent with the standard operating procedures.
- (6) Initiate an accountability and inventory worksheet.
- (7) Develop an effective incident organization by managing resources, maintaining an effective span of control, and maintaining direct supervision over the entire incident, and designate supervisors in charge of specific areas or functions.

- (8) Review, evaluate, and revise the incident action plan as required.
- (9) Continue, transfer, and terminate command.
- (10) On incidents under the command authority of the fire department, provide for liaison and coordination with all other cooperating agencies.
- (11) On incidents where other agencies have jurisdiction, implement a plan that designates one incident commander or that provides for unified command.
- (12) Interagency coordination shall meet the requirements of NFPA 1561, *Standard on Emergency Services Incident Management System*.

8.1.9 The fire department shall establish and ensure the maintenance of a fire dispatch and incident communications system that meets the requirements of NFPA 1561, *Standard on Emergency Services Incident Management System*, and NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*.

8.1.10* The fire department standard operating procedures shall provide direction in the use of clear text radio messages for emergency incidents.

8.1.10.1 The standard operating procedures shall use "emergency traffic" as designator to clear the radio traffic.

8.1.10.2 This "emergency traffic" shall be permitted to be declared by the incident commander, tactical level management component supervisor, or member in trouble or subjected to emergency conditions.

8.1.11* When a member has declared "emergency traffic," that person shall use clear text to identify the type of emergency, change in conditions, or tactical operations.

8.1.11.1 The member who has declared the "emergency traffic" shall conclude the "emergency traffic" message by transmitting "all clear, resume radio traffic" to end the emergency situation or to re-open the radio channels to communication after announcing the emergency message.

8.1.12* The fire department communications center shall start an incident clock when the first arriving unit is on-scene of a working structure fire, hazardous materials incident, or when other conditions appear to be time sensitive or dangerous.

8.1.12.1 The dispatch center shall notify the incident commander at every 10-minute increment with the time that resources have been on the incident (e.g., incident clock is 10, 20, or 30 minutes), until the fire is knocked down or the incident becomes static.

8.1.12.2 The incident commander shall be permitted to cancel the incident clock notification through the fire department communications center based on the incident conditions.

8.2 Risk Management During Emergency Operations.

8.2.1* The incident commander shall integrate risk management into the regular functions of incident command.

8.2.2* The concept of risk management shall be utilized on the basis of the following principles:

(1) Activities that present a significant risk to the safety of members shall be limited to situations where

there is a potential to save endangered lives.

(2) Activities that are routinely employed to protect property shall be recognized as inherent risks to the

safety of members, and actions shall be taken to reduce or avoid these risks.

(3) No risk to the safety of members shall be acceptable when there is no possibility to save lives or

property.

8.2.3* The incident commander shall evaluate the risk to members with respect to the purpose and potential results of their actions in each situation.

8.2.3.1 In situations where the risk to fire department members is excessive, as defined by 8.2.2, activities shall

be limited to defensive operations.

8.2.4 Risk management principles shall be routinely employed by supervisory personnel at all levels of the incident management system to define the limits of acceptable and unacceptable positions and functions for all members at the incident scene.

8.2.5* At significant incidents and special operations incidents, the incident commander shall assign an incident safety officer that has the expertise to evaluate hazards and provide direction with respect to the overall safety of personnel.

8.2.6 At civil disturbances or incidents involving the risk for physical violence, the incident commander shall

ensure that appropriate protective equipment (e.g., body armor) is available and used before members are

allowed to enter the hazard area.

8.2.7 At terrorist incidents or other incidents involving potential nuclear, biological, and chemical exposure, the

incident commander shall exercise risk management practice and ensure that appropriate protective equipment

is available for and used by members at risk.

8.2.8* Because of the possibility of members being exposed to nerve agents during terrorist activities, fire

departments shall consider providing atropine auto-injectors for members.

8.3 Personnel Accountability During Emergency Operations.

8.3.1* The fire department shall establish written standard operating procedures for a personnel accountability system that is in accordance with NFPA 1561, *Standard on Emergency Services Incident Management System*.

8.3.2 The fire department shall consider local conditions and characteristics in establishing the requirements of the personnel accountability system.

8.3.3 It shall be the responsibility of all members operating at an emergency incident to actively participate in the personnel accountability system.

8.3.4 The incident commander shall maintain an awareness of the location and function of all companies or crews at the scene of the incident.

8.3.5 Officers assigned the responsibility for a specific tactical level management component at an incident shall directly supervise and account for the companies and/or crews operating in their specific area of responsibility.

8.3.6 Company officers shall maintain an ongoing awareness of the location and condition of all company members.

8.3.7 Where assigned as a company, members shall be responsible to remain under the supervision of their assigned company officer.

8.3.8 Members shall be responsible for following personnel accountability system procedures.

8.3.9 The personnel accountability system shall be used at all incidents.

8.3.10* The fire department shall develop the system components required to make the personnel accountability system effective.

8.3.11* The standard operating procedures shall provide the use of additional accountability officers based on the size, complexity, or needs of the incident.

8.3.12 The incident commander and members who are assigned a supervisory responsibility for a tactical level management component that involves multiple companies or crews under their command shall have assigned a member(s) to facilitate the ongoing tracking and accountability of assigned companies and crews.

8.4 Members Operating at Emergency Incidents.

8.4.1 The fire department shall provide an adequate number of personnel to safely conduct emergency scene operations.

8.4.1.1* Operations shall be limited to those that can be safely performed by the personnel available at the scene.

8.4.2 No member or members shall commence or perform any fire-fighting function or evolution that is not within the established safety criteria of the organizational statement as specified in 4.1.1.

8.4.3 When inexperienced members are working at an incident, direct supervision shall be provided by more experienced officers or members.

8.4.3.1 The requirement of 8.4.3 shall not reduce the training requirements contained in 5.1.3 and 5.1.4.

8.4.4* Members operating in hazardous areas at emergency incidents shall operate in crews of two or more.

8.4.5 Crew members operating in hazardous areas shall be in communication with each other through visual, audible, or physical means or safety guide rope, in order to coordinate their activities.

8.4.6 Crew members shall be in proximity to each other to provide assistance in case of emergency.

8.4.7* In the initial stages of an incident where only one crew is operating in the hazardous area at a working structural fire, a minimum of four individuals shall be required, consisting of two individuals working as a crew in the hazard area and two individuals present outside this hazard area available for assistance or rescue at emergency operations where entry into the danger area is required.

8.4.8 The standby members shall be responsible for maintaining a constant awareness of the number and identity of members operating in the hazard area, their location and function, and time of entry.

8.4.9 The standby members shall remain in radio, visual, voice, or signal line communication with the crew.

8.4.10 The "initial stages" of an incident shall encompass the tasks undertaken by the first arriving company with only one crew assigned or operating in the hazard area.

8.4.11* One standby member shall be permitted to perform other duties outside of the hazard area, such as apparatus operator, incident commander, or technician or aide, provided constant communication is maintained between the standby member and the members of the crew.

8.4.12 The assignment of any personnel, including the incident commander, the safety officer, or operators of fire apparatus, shall not be permitted as standby personnel if by abandoning their critical task(s) to assist or, if necessary, perform rescue, they clearly jeopardize the safety and health of any fire fighter working at the incident.

8.4.12.1 No one shall be permitted to serve as a standby member of the fire-fighting crew when the other

activities in which the fire fighter is engaged inhibit the fire fighter's ability to assist in or perform rescue, if necessary, or are of such importance that they cannot be abandoned without placing other fire fighters in danger.

8.4.13 The standby member shall be provided with at least the appropriate full protective clothing, protective equipment, and SCBA.

8.4.13.1 The full protective clothing, protective equipment, and SCBA shall be immediately accessible for use by the outside crew if the need for rescue activities inside the hazard area occurs.

8.4.14 The standby members shall don full protective clothing, protective equipment, and SCBA prior to entering the hazard area.

8.4.15 When only a single crew is operating in the hazard area in the initial stages of the incident, this standby member shall be permitted to assist with, or if necessary perform, rescue for members of his/her crew, provided that abandoning his/her task does not jeopardize the safety or health of the crew.

8.4.16 Once a second crew is assigned or operating in the hazard area, the incident shall no longer be considered in the "initial stage," and at least one rapid intervention crew shall comply with the requirements of 8.5.4.

8.4.17 Initial attack operations shall be organized to ensure that, if on arrival at the emergency scene, initial attack personnel find an imminent life-threatening situation where immediate action could prevent the loss of life or serious injury, such action shall be permitted with less than four personnel when conducted in accordance with 8.5.5.

8.4.17.1 No exception to 8.4.17 shall be permitted when there is no possibility to save lives.

8.4.17.2 Any such actions taken in accordance with this section shall be thoroughly investigated by the fire department with a written report submitted to the fire chief.

8.4.18* At aircraft rescue fire-fighting incidents, the initial IDLH shall be identified as the area within 23 m (75 ft) of the skin of the aircraft.

8.4.19 After size-up, the incident commander shall adjust the IDLH designation as the situation dictates to meet operational needs.

8.4.20 Aircraft rescue fire-fighting operations inside the area identified as the IDLH shall be in accordance with 8.4.4.

8.4.21* When members are performing special operations, the highest available level of emergency medical care shall be standing by at the scene with medical equipment and transportation capabilities. Basic life support shall be the minimum level of emergency medical care.

8.4.22 Emergency medical care and medical monitoring at hazardous materials incidents shall be provided by or supervised by personnel who meet the minimum requirements of NFPA 473, *Standard for Competencies for EMS Personnel Responding to Hazardous Materials Incidents*.

8.4.23 At all other emergency operations, the incident commander shall evaluate the risk to the members operating at the scene and, if necessary, request that at least basic life support personnel and patient transportation be available.

8.4.24 When members are operating from aerial devices, they shall be secured to the aerial device with a system in compliance with NFPA 1983, *Standard on Fire Service Life Safety Rope and System Components*.

8.4.25 When members are operating at an emergency incident and their assignment places them in potential conflict with motor vehicle traffic, they shall wear a garment with fluorescent and retro-reflective material.

8.4.26 Apparatus shall be utilized as a shield from oncoming traffic wherever possible.

8.4.27* When acting as a shield, apparatus warning lights shall remain on, if appropriate. Fluorescent and retroreflective warning devices such as traffic cones (with DOT-approved retro-reflective collars) and DOT approved retro-reflective signs stating "Emergency Scene" (with adjustable directional arrows) and illuminated warning devices such as highway flares and/or other appropriate warning devices shall be used to warn oncoming traffic of the emergency operations and the hazards to members operating at the incident.

8.4.28 The incident commander shall ensure arson investigators or other members that enter an IDLH atmosphere or hazardous area use the appropriate personal protective equipment and/or SCBA.

8.4.29* Members involved in water rescue shall be issued and wear personal flotation devices that meet U.S. Coast Guard requirements.

8.5 Rapid Intervention for Rescue of Members.

8.5.1 The fire department shall provide personnel for the rescue of members operating at emergency incidents.

8.5.2 A rapid intervention crew/company shall consist of at least two members and shall be available for rescue of a member or a crew.

8.5.2.1 A rapid intervention crew/company shall be fully equipped with the appropriate protective clothing, protective equipment, SCBA, and any specialized rescue equipment that could be needed given the specifics of the operation under way.

8.5.3 The composition and structure of a rapid intervention crew/company shall be permitted to be flexible based on the type of incident and the size and complexity of operations.

8.5.4 The incident commander shall evaluate the situation and the risks to operating crews and shall provide one or more rapid intervention crew/company commensurate with the needs of the situation.

8.5.5 In the early stages of an incident, which includes the deployment of a fire department's initial attack assignment, the rapid intervention crew/company shall be in compliance with 8.4.11 and 8.4.12 and be either one of the following:

- (1) On-scene members designated and dedicated as rapid intervention crew/company
- (2) On-scene members performing other functions but ready to re-deploy to perform rapid intervention crew/company functions

8.5.5.1 The assignment of any personnel shall not be permitted as members of the rapid intervention crew/company if abandoning their critical task(s) to perform rescue clearly jeopardizes the safety and health of any member operating at the incident.

8.5.6 As the incident expands in size or complexity, which includes an incident commander's requests for additional resources beyond a fire department's initial attack assignment, the dedicated rapid intervention crew/company shall on arrival of these additional resources be either one of the following:

- (1) On-scene members designated and dedicated as rapid intervention crew/company
- (2) On-scene crew/company or crews/companies located for rapid deployment and dedicated as rapid intervention crews

8.5.6.1 During fire fighter rescue operations each crew/company shall remain intact.

8.5.7 At least one dedicated rapid intervention crew/company shall be standing by with equipment to provide for the rescue of members that are performing special operations or for members that are in positions that present an immediate danger of injury in the event of equipment failure or collapse.

Appendix R

Special Reports From Members Involved

F
M

NAME & TITLE Reese Wingate, Battalion Chief #1A

UNIT OR BUREAU

1st Battalion

SUBJECT

Macon Street Fire

BALTIMORE
CITY
FIRE DEPARTMENT

SPECIAL REPORT

TO .Mr. William J. Goodwin Jr.
Chief of Fire Department

Date: October 12, 2006

Respectfully report the following information concerning my operations on the fire ground:

Arrived on scene passing front of dwelling and gave initial report. Parked at NE corner of Fleet and Macon Sts...Made a quick pass of alley to observe conditions in rear. Upgraded incident to working fire. Requested second medic unit. Requested Rescue 1 and additional truck. Updated conditions and requested 2nd alarm. E41 reported getting hot, they were backing out. Acknowledged same. Quick release of smoke, heat and pressure caused door to close trapping members. Requested two additional medic units. Requested Safety Officer to do PAR. Requested additional EMS Officer. Portable mikes became stuck in open position, switched radio to A1 and requested Communications to assign another fireground channel. Requested Communications to place EMS operations on separate channel. Announced all members stay out of original fire building. Battalion Commander # 4 arrived on scene and was designated Water Officer. Division Chief #1 assumed command.

SIGNATURE: Reese Wingate BC1A

COMMENTS: _____

Signature: Reese Wingate 10/12/06

Battalion Chief No. 1A

Forwarded ☒ Approved ☐ Disapproved ☐Forwarded ☐ Approved ☐ Disapproved ☐Forwarded ☐ Approved ☐ Disapproved ☐Forwarded ☐ Approved ☐ Disapproved ☐

Division Chief

Deputy Chief

Chief of Fire Dept.

F
D
M

NAME & TITLE

Ronald J. Hudgins, Battalion Chief 2A A/2

UNIT OR BUREAU

Second Battalion

SUBJECT

Dwelling Fire - 514 South Macon Street

BALTIMORE

CITY

FIRE DEPARTMENT

SPECIAL REPORT



TO

Mr. William J. Goodwin, Jr.
Chief of Fire Department

Date: October 10, 2006

Respectfully report the following information as related to the dwelling fire at 514 South Macon Street

at 0222 hours this date. Upon arrival I reported to the rear, where Truck 3 members were throwing ladders, Engine 5 was stretching a line from the Fleet Street end of the alley, and Engine 51 members were stretching a line down from the Eastern Avenue end of the alley. Extremely heavy fire conditions had already taken control of the basement, first and second floors. The fire was blowing out all three levels, and extending in 512 and 516 on the second floor levels. BC 1 made it a working fire and requested an additional Truck. Within minutes I sent Engine 51 back to get a 2 1/2 inch line in service, and BC1 requested a second alarm. Truck 3 entered the exposure on side delta, with a hand line from Engine 51. Squad 54 entered exposure bravo with a hand line, with the members from Rescue 1. Two members from Truck 3 also went to the roof to open same. No entry was made into the rear of the fire building due to collapse. Extensive amount of Electric wiring were also burning in the rear hindering our ability to make a speedy entry. It seemed to take a considerable amount of time to extinguish the fire due to the volume of fire and condition of the dwellings upon our arrival.

SIGNATURE:

Ronald J. Hudgins 10/10/06
BC2AA/2

COMMENTS:

Signature:

Ronald J. Hudgins 10/10/06
Battalion Chief No. 2AForwarded ☐ Approved ☐ Disapproved ☐Forwarded ☒
Approved ☒ Disapproved ☐Forwarded ☐
Approved ☐ Disapproved ☐Forwarded ☐
Approved ☐ Disapproved ☐

Division Chief

Deputy Chief

Chief of Fire Dept.

1140-27-23

F
R
C
M

NAME & TITLE

John M. Baker, Battalion Chief 1-C

UNIT or BUREAU

1st Battalion

SUBJECT

Special Reports - Box 11-7, 0221, 10-10-06

BALTIMORE

CITY

FIRE DEPARTMENT

SPECIAL REPORT



TO: Mr. William J. Goodwin, Jr.,
Chief of Fire Department

DATE: October 10, 2006

Respectfully submit Special Reports from all members on 1st alarm of fire, Box 11-7, 0221 hours, October 10, 2006. Most reports contain numerous spelling, grammatical and procedural errors. As directed by Mr. Gregory Ward, Division Chief #2, all reports forwarded without corrections so as not to create delay in receiving vital information from members in service on fireground, Box 11-7.

COMMENTS:

SIGNATURE: John M. Baker, BC-1C
10-10-06

SIGNATURE: John M. Baker
Battalion Chief No. 1C 10-10-06

Forwarded ☐ Approved ☐ Disapproved ☐
Forwarded ☐ Approved ☐ Disapproved ☐

Forwarded ☐ Approved ☐ Disapproved ☐

Forwarded ☐ Approved ☐ Disapproved ☐


Division Chief

Deputy Chief
☐ Operations ☐ Administration

Chief of Fire Department

1400-10-57

FROM
TO

NAME & TITLE	John D. Boblits, Lieutenant C/1	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
UNIT OR BUREAU	Health and Safety Office		
SUBJECT	Fire 512 Macon Street		

Mr. William J. Goodwin Jr.
Chief of Fire Department

Date: October 10, 2006

Respectfully submit the following information regarding the fire at 512 Macon Street.

The officer of Truck 20 reported upon there arrival there was heavy smoke showing from the first and second floor. Truck 20 threw the aerial ladder to the roof and a 24 foot ground ladder to the front of the building. One member opened the roof skylight and fire came out. One member opened the second floor window closest to the bravo side exposure. A civilian jump from the second floor window before there arrival.

The officer of Truck 3 reported that all three floors including the basement where fully involved in the rear of the dwelling. They encountered live wirers in the rear yard arcing. They also encountered intense heat in the rear. They had lines in the rear protecting exposures.

The officer of Engine 41 reported that they arrived at about the same time as S 11. S 11 pulled off their five side pre connect they assisted them put the line in-service . The officer then went back to S 11 and pulled the three side to back them up. When he entered the building there was extreme heat conditions. He then exited the front door and ventilated the front window on the first floor. When the window opened the fire seemed to flash and the front door slammed shut. He then tried to get the door open but the door seemed to be jammed or there weight against it. When they got the door opened enough they were able to remove two firefighters the door then slammed shut a second time. The door was pried off it hinges and the third firefighter was removed.

The officer of Engine 50 they led off from the hydrant at Macon and Foster when they pulled up they found out the hydrant was dead they took lines off of Engine 5 and protected the exposures on Bravo and Delta sides in the rear.

SIGNATURE: _____

COMMENTS: _____

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Signature: _____

Battalion Chief No. _____

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Division Chief

Deputy Chief

Chief of Fire Dept.

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R
M

NAME & TITLE

Michael Hollingshead Lieutenant A/2

UNIT or BUREAU

Engine 41

SUBJECT

Fire Box 11-7

BALTIMORE

CITY

FIRE DEPARTMENT

SPECIAL REPORT



TO: Mr. William J. Goodwin, Jr.,
Chief of Fire Department

DATE: October 10, 2006

Respectfully report Engine 41 covered Squad 11 hydrant and went to the front of the fire building. After arriving to the front of building I pulled off the 3 side of 1 3/4" from Squad 11. The 3 side was too short and I called for additional line. I was about 5ft. in to the building and felt that it was too hot and called on the radio to open up the building and came back outside to break the front window. I entered the fire building and called out we had to get out because it was too hot in here. Members were evacuating the building when the fire flashed over and closed the door behind the firefighters. I pushed and kicked the door trying to get it open but could not due to firefighters being wedged behind the front door. I helped pull members out of the fire building. Firefighter Alan Roberts was wedged between the wall and the front door. The door was made of metal which made the rescue more difficult and took more time to perform. The hallway leading to the door was very narrow and long which also added to the difficulty of performing the rescue.

COMMENTS:

NOTED: JAB, BCIL

SIGNATURE: *LT. Michael Hollingshead E-41 A/2*
10/10/06

SIGNATURE: *John W. Baker*
Battalion Chief No. 1C 10-1006

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Division Chief

Deputy Chief

Chief of Fire Department

☐ Operations ☐ Administration

1400-10-57

F P M	NAME & TITLE Richard A. VENANZI, Pump Operator, A-3	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
	UNIT OR BUREAU ENGINE Co. 41		
	SUBJECT FIRE BOX 11-7		

TO MR. William J. Goodwin, Jr.
Chief of Fire Department

Date: October 10, 2006

I respectfully like to report my actions
ON FIRE BOX 11-7 AT 02:22 A.M. ON OCTOBER 10, 2006.
ENGINE Co. 41 was second ENGINE listed
ON this fire box, Thus covering Squad-11's plug
AT the S.E. CORNER of MACON ST. + EASTERN AVE.
AFTER ARRIVAL ON SCENE I began To hook up
and pump said plug.

SIGNATURE: Richard A. Venanzi

COMMENTS: NOTED: GMB, BC-1C

Signature: John M. Baker
Battalion Chief No. 1C 1670-00

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Approved ☐ Disapproved ☐

Shift Commander

Assistant Chief

Chief of Fire Dept.

F P M	NAME & TITLE <u>Andre L. Darden</u>	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
	UNIT OR BUREAU <u>Squad 11</u>		
	SUBJECT <u>Fire Box 11-7</u>		

TO MR. William S. Goodwin Jr. Date: October 10, 2006
Chief of Fire Department

Respectfully report at 0222 hours we responded to a dwelling fire at 512 S. Macon st inc #122597. Upon arrival we lead off at water hydrant at Macon & Eastern Ave we used 5 section of hose to front of dwelling After doing so we advanced the line in hallway to the stairs. It started getting extremely hot We were told to back out At that time the front door slightly closed three members were trap on the other side of door. We pulled the three member from the dwelling


SIGNATURE: [Signature] SQ11 A/P
10/10/06

COMMENTS: NOTED: JMB, BCIC

Signature: [Signature] Battalion Chief No. 10 10-06

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Shift Commander	Assistant Chief	Chief of Fire Dept.

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NAME & TITLE <i>Charles J Trimpel</i>	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
UNIT OR BUREAU <i>SQUAD 11</i>		
SUBJECT <i>Fire Box 11-7</i>		

Date: *10-10-06*

Mr. William J Goodwin Jr
Chief of Fire Department

Respectfully report at 0222 Hrs, We responded to a report of a dwelling fire at 512 S. Macen St. Upon our arrival we Found Heavy Smoke conditions From the dwellings windows, We Lead off From the hydrant at Eastern Ave. and Macen St Went to the Front and Put (2) 1 3/4 Lines in service.

SIGNATURE: _____

COMMENTS: *NOTED: JMB, SG/LC*

Signature: *John W. Baker*
Battalion Chief No. *12* *10-10-06*

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Approved ☐ Disapproved ☐

Shift Commander

Assistant Chief

Chief of Fire Dept.

F P C M TO	NAME & TITLE FPA BUTLER, JAMES R 2514 A/G	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
	UNIT OR BUREAU SQUAD 11		
	SUBJECT MACON STREET FIRE 10/10/2006		

Date: **10/10/2006**

CHIEF WILLIAM J GOODWIN, CHIEF OF FIRE DEPARTMENT


RE: MY PERSONAL ACCOUNT OF EVENTS

ON THE MORNING OF OCTOBER 10, APPROXIMATELY 1215, SQUAD 11 WAS DISPATCHED TO A REPORT OF FIRE ON MACON STREET. UPON ARRIVAL, SQUAD 11 LED OFF 3" LINE FROM THE HYDRANT AT THE CORNER OF EASTERN AND MACON STREETS. SQUAD 11 POSITIONED THEMSELVES APPROX. 2 DOORS NORTH OF THE FIRE DWELLING. ENGINE 41 PERSONNEL ALAN ROBERTS AND BRANDON MATTOX HAD PULLED THE 5 SECTION PRECONNECT AND WERE ADVANCING TO THE FRONT DOOR BY THE TIME I HAD GOTTEN TO THE OFFICER'S SIDE OF THE SQUAD. AT THE DOOR, ALAN ROBERTS HAD THE NOZZLE, BRANDON MATTOX WAS POSITIONED BEHIND HIM, I TOOK POSITION BEHIND MATTOX, AND NANCY GOEB TOOK POSITION BEHIND ME. WE ADVANCED INTO THE DWELLING AND BEGAN TO ADVANCE UP THE STAIRS WHEN WE RECEIVED A MESSAGE TO EVACUATE BECAUSE OF A FIRE IN THE BASEMENT. I PASSED THE MESSAGE TO MATTOX, WHO PASSED IT FORWARD TO ROBERTS. WE ALL BEGAN TO WITHDRAW WHEN THE HEAT BEGAN TO RISE RAPIDLY. WE REACHED THE FRONT DOOR, WHICH HAD CLOSED, WHEN ROBERTS AND MATTOX COLLAPSED AGAINST ME. AFTER FORCING THEM OFF OF ME, I MANAGED TO GET THE DOOR OPEN ENOUGH TO GET MY HEAD OUT, AT WHICH POINT I WAS DRAGGED FROM THE DOORWAY, MATTOX WAS PULLED OUT ~~100~~ 4 OR 5 SECONDS LATER AND WE WERE LED TO MEDIC 10 SIGNATURE: **James R Butler**

COMMENTS: **NOTED: JMB, B-11**

Signature: **John M. Baker** Battalion Chief No. **1215-1006**

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Shift Commander	Assistant Chief	Chief of Fire Dept.

F P M	NAME & TITLE <i>Nancy Goetz FFPM</i>	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
	UNIT OR BUREAU <i>SQUAD 11</i>		
	SUBJECT <i>Fire Box 11-7</i>		

TO

Date: *October 10, 2006*

Mr. William J. Goodwin Jr.
Chief of Fire Department

Respectfully report at 0222 hours we responded to a dwelling fire at 512 S. Macon St., inc #122597. Upon arrival I lead off at the hydrant on the Southeast corner of Eastern Avenue and Macon Street. After donning my SCBA I went to the front of the fire building to find heavy black smoking coming out of the second floor window as well as the front door. I entered the building through the front door and found members on their knees attempting to locate the fire.

I was able to get approximately 3 feet inside before I heard members screaming, "It's hot, it's hot." I stopped and assisted pulling hose into the dwelling. There was a sudden flash of heat and I turned and exited the front door. I turned back to find that the front door was partially closed and members were trapped behind it. I assisted in pulling the three members out and then assisted the members of medic 10 with the treatment of one of them.

SIGNATURE:

FFPM NCG SQUAD 11

COMMENTS:

NOTED: JMO, BEIC

Signature:

John M. Baker

Battalion Chief No. *1C 10-10-06*

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Disapproved ☐

Shift Commander

Assistant Chief

Chief of Fire Dept.

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NAME & TITLE

Donald J. Schafer Jr., A/5, Lieutenant

UNIT or BUREAU

Engine Company # 5

SUBJECT

South Macon Street Dwelling Fire

BALTIMORE

CITY

FIRE DEPARTMENT

SPECIAL REPORT



TO: Mr. William J. Goodwin, Jr.,
Chief of Fire Department

DATE: October 10, 2006

Respectfully report upon arrival at the scene of fire Engine # 5 proceeded down Fleet Street from Oldham Street. I in full turnouts and SCBA stretched a 1 3/4 hose line down the alley to the rear of the dwelling and proceeded to cover exposures knowing companies were coming in through the front. After confirming that all members were evacuated from the front I directed member on the pipe to direct water into the dwelling.

COMMENTS:

NETED: J.M.B., DC-12

SIGNATURE:

Donald J. Schafer Jr., A/5, U.
October 19, 2006

SIGNATURE:

John M. Baker

Battalion Chief No. 12

Forwarded ☒ Approved ☐ Disapproved ☐
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Division Chief

Deputy Chief

Chief of Fire Department

☐ Operations ☐ Administration

F R E M	NAME & TITLE Darren Della Noce Pump Operator	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
	UNIT OR BUREAU E-5		
	SUBJECT Macon Street Dwelling Fire		

TO Mr. William J. Goodwin, Jr.
Chief of Fire Department

Date: 10/10/06


Respectfully report that on the above fire Engine 5 reported to the rear of Dwelling. I placed the engine at Macon and Fleet. Due to no hydrant Engine 50 supplied hose line from Foster and Macon to Engine 5. I deployed two 1 3/4 hose lines to the rear of Dwelling.

SIGNATURE: PO Darren S. Della Noce E-5 10/10/06

COMMENTS: NOTED: JMB, BCL

*Signature: John M. Becker
Battalion Chief No. 1C 10-10-06

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Shift Commander	Assistant Chief	Chief of Fire Dept.

F R M	NAME & TITLE	BALTIMORE	
	UNIT OR BUREAU	CITY	
	SUBJECT	FIRE DEPARTMENT	
		SPECIAL REPORT	

TO Mr. William J. Goodwin Jr.
 Chief of Fire Department


Date: 10-10-06

Respectfully report that I was assigned the pipe position on Engine 5 on the above incident. After advancing an 1 3/4" down the alley to the rear of the dwelling, I saw a large volume of fire engulfing the whole rear of the house - basement, 1st floor, + 2nd floor. I put on my S.C.B.A., entered the yard, and began flowing water toward the 2nd floor exterior before getting permission to direct the stream into the basement. However, due to power lines arcing overhead, I was ordered back to the alley where I continued to flow water to all parts of the dwelling with other companies until the fire was extinguished.

SIGNATURE: FP Dennis W. Bentz
 E-5 A-1

COMMENTS: NOTED: JMB, DCIC

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Shift Commander	Assistant Chief	Chief of Fire Dept.	

F R C M TO	NAME & TITLE <i>Mark B. Woodruff Firefighter 12/4</i>	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
	UNIT OR BUREAU <i>Engine 51</i>		
	SUBJECT <i>Macon Street Dwelling Fire</i>		

Date: *October 10, 2006*

TO
Mr. William J. Goodwin
Chief of Fire Department


Respectfully report that upon arrival on the scene of the Macon St. fire, I was in full turnout gear. I assisted the officer and pipeman from Engine Five with their handline. We advanced the line down the rear alley to the fire building. We remained in the rear yard as the amount of fire would not allow us to advance any further. We remained there until the bulk of the fire was knocked.

SIGNATURE: *Mark B. Woodruff E-51 12/4*

COMMENTS: *NOTED. JMB, BG/K*

Signature: *John M. Baker*
Battalion Chief No. *16-10-06*

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Shift Commander	Assistant Chief	Chief of Fire Dept.

F M TO	NAME & TITLE FPA Stanley C. Abler II A1 2504	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
	JNIT OR BUREAU Sg 11		
	SUBJECT Box 11-7 pg 1		

Date: 10/10/06

Chief William Goodwin

Respectfully report I responded to box 11-7, these are the Accounts I witnessed, my partner and I were dispatched as the Medic on the first box. We parked at the corner of Eastern & Macon, I approached the fire scene and saw smoke & fire coming from roof & back, I got the report of civilians injured. My partner and I started treating the two civilians. They had minor injuries. As oxygen was being administered to the civilians two fire fighters (FPA Mattox & FPA Butler) were dragged out of the building. I brought them over and proceeded to take there turn out coats & SCBA off. They had 2nd & 3rd degree burns. FPA Mattox ~~continued~~ was screaming that there was still a firefighter trapped inside. After getting there gear off I proceeded to the front of fire building. I helped pull the 3rd firefighter to the curb. I assisted in taken his SCBA off of him so he could be put on the back board. Once on the back board & stretcher a BVM was initiated and movement to the medic was started. I did compressions as other medic personnell worked on air, intubation, and IV fluids. I was relieved of compressions and ordered to stay with medic by captain shiloe. (see Attachment)

SIGNATURE:


  A1

COMMENTS:

Signature: _____

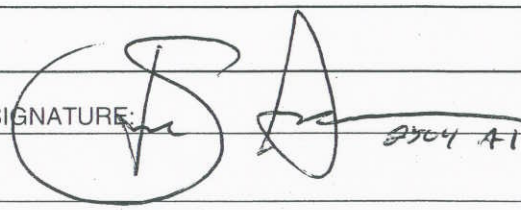
Battalion Chief No. _____

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Shift Commander	Assistant Chief	Chief of Fire Dept.

UNIT OR BUREAU Sgt 11		BALTIMORE CITY FIRE DEPARTMENT	
SUBJECT Box 11-7 pg 2		SPECIAL REPORT	

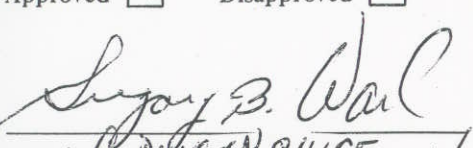
TO _____ Date: 10/10/06


I was then told to drive the medic to Bayview hospital. once at bay view I assisted by doing compressions until I was relieved by hospital personell

SIGNATURE:  2504 AI

COMMENTS: NOTED: JMB, BGIC

Signature: John M. Baker
Battalion Chief No. 12 10-1006

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 District Chief, 10/10/06	Assistant Chief	Chief of Fire Dept.

F R M	NAME & TITLE	Robert S. Bentz Firefighter A/6	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
	UNIT OR BUREAU	Engine 51		
	SUBJECT	Fire Box 11-7		

TO

Date: 10-10-06


Respectfully report that after responding to Box Alarm 11-7 for a dwelling fire at 514 South Macen St. at 0221 hours, incident number 612259 I took the fire section crosslay to the rear of the fire building. Assisted other members connecting to a gated wye. Returned to the rear of the fire building and performed exterior operations with an 1 3/4" handline. I was wearing full turn out gear and S.C.B.A.

SIGNATURE: *RL Bentz A-6*
Firefighter Engine 51

COMMENTS: *NOTED JMB BC-12*

Signature: *John M. Baker*
Battalion Chief No. *12 10-10-06*

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Shift Commander	Assistant Chief	Chief of Fire Dept.

F R M TO	NAME & TITLE <i>William H Pleiss F.E. A-3</i>	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
	UNIT OR BUREAU <i>Engine Co 51</i>		
	SUBJECT <i>Dwelling fire 5145 Macon St</i>		

TO *Mr William S Goodwin*
Chief of Fire Department.

Date: *October 10, 2006*

Respectfully report that upon responding on box 11-7 for a dwelling fire at 5145 Macon St. at 0221 hrs, incident #612259. I lead off from a hydrant on the north east corner of Eastern Ave and Macon St. I then stretched a 3" line with a gated wye down the alley towards the rear of the dwelling. Assisting other members of E51 we ran two 1 3/4" lines from the wye to the rear of the dwelling. We remained in the rear performing an exterior attack on the fire until it was extinguished.

I was wearing full turn out gear and SCBA during this time

SIGNATURE: *William H Pleiss 10/10/06*

COMMENTS: *NOTED: JMB, BCL*

Signature: *John M. Baker*
Battalion Chief No. *1C 10-10-06*

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Shift Commander

Assistant Chief

Chief of Fire Dept.

F C M TO	NAME & TITLE	KARL V. MILLER Pump Operator A/S	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
	UNIT OR BUREAU	ENGINE 51		
	SUBJECT	Fire Box 11-7		

Date: October 10, 2006


Respectfully report the following information in reference to Box 11-7. Incident # 612259 at 514 South MAcon St. on October 10, 2006 at 0221 hours. As Pump Operator of Engine 51 had arrived on the scene as the third engine on scene. Led off from a hydrant from the N.E corner of Eastern Ave. / S. MAcon St. Extended @ 250' of 1 3/4" hose line to rear alley of Fire Building. and extending 150' of 3" supply line to gated wye to further extend the two 1 3/4" lines to rear of fire building. Placed lines service then proceeded to extend a 2 1/2" Blitz line to rear of Fire building @ 200' of blitz line then extending another 150' of 3" supply line to further extend 2 1/2" Blitz line. Placed blitz line in service after changing hydrant at N.E. corner of Eastern Ave / S. MAcon St. Changed pumps over from tank pressure to hydrant pressure and Monitor pump Panel through remainder of Fire operations.

SIGNATURE: Karl V. Miller A/S 10/10/06
Pump Operator Engine 51

COMMENTS: NOTED: JMB, BGIL

Signature: John M. Baker
Battalion Chief No. 1C1010-06

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Shift Commander	Assistant Chief	Chief of Fire Dept.

F P M	NAME & TITLE	Kirk Thomas A/1, Captain	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
	UNIT OR BUREAU	Engine #51		
	SUBJECT	Box 11-7		

TO Mr. William J. Goodwin, Jr.
Chief of Fire Department

Date: October 10, 2006

Respectfully report the following information in reference to Box 11-7, 512 S. Macan St, at 0221 hours on October 10, 2006.

We arrived as the third engine company and lead off from a hydrant at the Northeast corner of S. Macan St and Eastern Ave. All members were in full turnouts with SCBA as we stretched hose line to the rear, via the side and rear alley. We put two 1 3/4" attack lines in service as well as 1 2 1/2" line. From the rear we encountered heavy fire coming from the basement 1st, and second floors. We had line water coming in the rear also. After getting orders from command, myself, FF Robert Bantz, 9/6, E-51, and FF William Pless, 9/2, E-51, each took a hand line and began battling the flames through the basement door and window, the 1st floor door and window and the second floor windows. We continued knocking down the flames until the fire was declared under control.

SIGNATURE:

Kirk Thomas A/1
10/10/06
CAPT-E-51

COMMENTS: NOTED: JMB, BC-12

Signature:

John M. Baker

Battalion Chief No 1C 10-10-06

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Shift Commander

Assistant Chief

Chief of Fire Dept.

F R C M	NAME & TITLE	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
	Douglas Wagerman A/6, Lieutenant		
	UNIT or BUREAU		
	Engine Co. #50		
	SUBJECT		
	Fire Box 11-7 @0223 hours on 10/10/06		

TO: Mr. William J. Goodwin, Jr.,
Chief of Fire Department

DATE: October 10, 2006

Respectfully reporting that on October 10, 2006 Box Alarm 11-7 @ 0223 hours Engine Company 50 was dispatched on a box alarm. Enroute to the scene at 512 S. Macon street Engine 50 came down Fleet street trying to lead off at a hydrant, as we were dispatched as the third engine in. There was no hydrants on Fleet that was accessible. The engine then backed up with spotters to Oldham street then preceeded south, down to Foster. We proceeded to turn west on Foster to Macon street where we had grabbed the hydrant at Foster and S. Macon. We encountered a delay in trying to make the turn onto Macon due to cars being parked at every corner that made the turn very tight. With spotters we were able to finally preceed down S. Macon street where we had grabbed the hydrant at Foster and S. Macon. Engine 50 supplied a line to Engine 5. Engine 50's crew grabed a 1 3/4" line off of Engine 5 and started down the alley behind the 512 S. Macon street. There was heavy smoke and fire on all 3 floors in rear of main fire building with extention to both adjoining houses. Per Battalion Chief 2 we were to just keep throwing water as needed. We entered the yard next to the main fire building and got as close as we could and with a straight stream aimed into the first floor of the main fire building while also putting water as needed on the exposure house's yard we were in. While fighting the fire a few minutes we lost water pressure due to the hydrant at foster and s. macon was a dead hydrant. Engine 50 and Engine 5 obtained another water source and we quickly had water again to continue fighting the fire. After a while the fire had a good knock in it and they sent units to relieve each other so that the initial 1st alarm could go to rehab and be checked out. While enroute to the scene all proper PPE, including face mask with SCBA, was put on and remained on until told otherwise by comand.

COMMENTS:

010720:JMB, BEL

SIGNATURE:

Douglas Wagerman A/6 ES
10/10/06

SIGNATURE:

John M. Baker

Battalion Chief No. 10-1006

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Division Chief

Deputy Chief


☐ Operations ☐ Administration

Chief of Fire Department

1400-10-57

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NAME & TITLE	Jessica Baumgartner Firefighter Paramedic Apprentice A/3
UNIT or BUREAU	Engine Co. #50
SUBJECT	Fire Box 11-7 @0223 hours on 10/10/06

BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
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TO: Mr. William J. Goodwin, Jr.,
Chief of Fire Department

DATE: October 10, 2006

Respectfully reporting that on October 10, 2006 Box Alarm 11-7 @ 0223 hours Engine Company 50 was dispatched on a box alarm. Enroute to the scene at 512 S. Macon street engine came down Fleet street trying to lead off at a hydrant, as we were dispatched as the third engine in. There was no hydrants on Fleet that was acessible. The engine then backed up with spoters to Oldham street then preceeded down foster to macon street where we encountered a delay in trying to make the turn onto macon due to cars being parked at every corner that made the turn very tight. With spoters we were able to finally preceed down S. Macon street where we had grabbed the hydrant at Foster and S. Macon. Engine 50 supplied a line to engine 5. Engine 50's Crew members grabed the line off of engine 5 and started down the alley behind the 512 S. Macon street. There was heavy smoke and fire in rear of main fire building with extention to both adjoining houses. Per Battalion Chief 2 we were to just keep throwing water as needed. We entered the yard next to the main fire building got as close as we could and with a straight stream aimed into the first floor of the main fire building while also putting water as needed on the exposure house yard we were in. While fighting the fire a few minutes we lost water pressure due to the hydrant at foster and s. macon was a dead hydrant. Engine 50 and engine 5 obtained another water source and we quickly had water again to continue fighting the fire. After a while fire had a good knock in it and they sent units to relieve each other so that the initial 1st alarm could go to rehab and be checked out. While enroute to the fire scene all proper PPE, inculding face mask with SCBA, was put on and remained on until told otherwise by command.

*AS Noted ABOVE -
Lt. Douglas Wegerman A/6, E50
10/10/06*


COMMENTS:

NOTED JMB BEIC

SIGNATURE: *Jessica Baumgartner E50/A3 10/10/06*

SIGNATURE: *John M. Baker*
Battalion Chief No. *1C 10-10-06*

Forwarded <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved <input type="checkbox"/>	Forwarded <input type="checkbox"/> Approved <input type="checkbox"/> Disapproved <input type="checkbox"/>	Forwarded <input type="checkbox"/> Approved <input type="checkbox"/> Disapproved <input type="checkbox"/>
Division Chief	Deputy Chief <input type="checkbox"/> Operations <input type="checkbox"/> Administration	Chief of Fire Department

F R M TO:	NAME & TITLE	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
	Scott Dorer Pump Operator A/1		
	UNIT or BUREAU		
	Engine Co. #50		
	SUBJECT		
	Fire Box 11-7 @0223 hours on 10/10/06		

TO: **Mr. William J. Goodwin, Jr.,**
Chief of Fire Department

DATE: October 10, 2006

Respectfully reporting that on October 10, 2006 Box Alarm 11-7 @ 0223 hours Engine Company 50 was dispatched on a box alarm. Enroute to the scene at 512 S. Macon street engine 50 came down Fleet street trying to lead off at a hydrant, as we were dispatched as the third engine in. There was no hydrants on Fleet that was acessible. The engine then backed up with spoters to Oldham street then preceeded down to foster to s. macon street where we encountered a delay in trying to make the turn onto macon due to cars being parked at every corner that made the turn very tight. With spoters we were able to finally preceed down S. Macon street where we had grabbed the hydrant at Foster and S. Macon. Engine 50 supplied a line to engine 5. connected the three inch line that was lead off by engine 50 to engine 5 and supplied them from the hydrant at foster and S. Macon. After FF Beegle tried to charge the engine co 50's hydrant they found that it was a dead hydrant. At that time engine 50 gave the tank water to engine co 5. FF Beegle flagged down Engine 6 to grab a hydrant at Oldham and Foster and supply engine 50's three inch that was at foster and s. macon. Engine 6 charged the hydrant and supplied water to engine 50 and also engine 5. While everything in progress maintained saftey with chocks, personal PPE, and monitoring the radio.

AS Noted ABOve —
H. Douglas Wgerman #6, E50
10/10/06

COMMENTS: *NOTED: JMB, DC-12*

SIGNATURE: *PA Scott W Dorer* *PH*

Forwarded <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved <input type="checkbox"/> Forwarded <input type="checkbox"/> Approved <input type="checkbox"/> Disapproved <input type="checkbox"/>			SIGNATURE: <i>John M. Boker</i> Battalion Chief No. <i>12 10-10-06</i>		
Division Chief 28-2100-0032		Deputy Chief <input type="checkbox"/> Operations <input type="checkbox"/> Administration		Chief of Fire Department 1400-10-57	

F
R
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M

NAME & TITLE

William Beegle Fire Fighter D/3

UNIT or BUREAU

Engine Co. #50

SUBJECT

Fire Box 11-7 @0223 hours on 10/10/06

BALTIMORE

CITY

FIRE DEPARTMENT

SPECIAL REPORT



TO: Mr. William J. Goodwin, Jr.,
Chief of Fire Department

DATE: October 10, 2006

Respectfully reporting that on October 10, 2006 Box Alarm 11-7 @ 0223 hours Engine Company 50 was dispatched on a box alarm. Enroute to the scene at 512 S. as the third engine in. I lead off from a hydrant at S. Macon St. and Foster Ave. that turned out to be dead. I went to P.O. Dorer to inform him of our problem. As we were working on a solution I saw engine 6 and got the P.O. to take me to Foster Ave. and S. Macon St. to lead that hydrant into the line engine 50 had previously led to the alley at the rear of the fire buildings. Assured there was a sufficient water supply to the fire ground when I went to the pumper, I put on my SCBA and joined Lt. Wagerman and FPA Baumgartner who were engaged in fire fighting in the rear of the fire building.

AS NOTED ABOVE

Lt. Douglas Wagerman #6 E50
10/10/06

SIGNATURE:

COMMENTS:

NOTED: JMB DC-12

SIGNATURE:

John M. Boker

Battalion Chief No. 12 10-10-06

Forwarded ☒ Approved ☐ Disapproved ☐
Forwarded ☐ Approved ☐ Disapproved ☐

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Forwarded ☐ Approved ☐ Disapproved ☐

Division Chief

Deputy Chief


☐ Operations ☐ Administration

Chief of Fire Department

1400-10-57

FORM

NAME & TITLE	EDWARDS A Turner Lieutenant A-1
UNIT OR BUREAU	TRUCK #20
SUBJECT	Fire Box 11-7 512 S. MACON ST

BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
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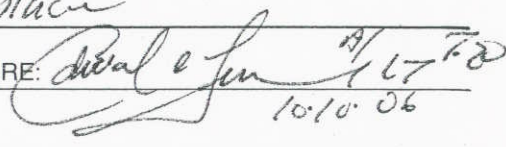
TO

Date:

Mr. WILLIAM J. GOODWIN Jr.
CHIEF OF FIRE DEPARTMENT

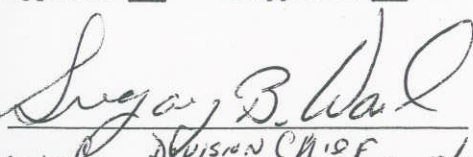
OCT 10, 2006


Respectfully report AT 0222 HRS, we responded to a Report of a dwelling fire 512 S. MACON ST, INC #122597 upon our arrival we found HEAVY SMOKE CONDITIONS in dwelling. We through our aerial to roof and EVA GUARDS A/3, went to roof and opened skylights, later saying Heavy fire conditions were in rear and came up through opening 15' upon removing same. The remaining members LT ED Turner A/1, EVA Kolycki A/2, RPA Parker A/4, through a 24' ladder to left front window and ventilated same, by this time IC Wingate informed me we needed an axe we had people trapped in 512. I assisted LT RPA E-41 Hollingshead A/1, after he removed door from our way in pulling THREE (3) injured Firefighters from area way behind front door where they were trapped, all members were in full turn-out gear with SCBA in place

SIGNATURE:  A-1 LT ED
10-10-06

COMMENTS: NOTED: JMB, DC-IC

Signature:  Battalion Chief No. 1C 10-10-06

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 noted DIVISION CHIEF 2 11/11/06		Chief of Fire Dept.

F R M TO:	NAME & TITLE	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
	Emergency Vehicle Driver, Joe R. Evans, A/3		
	UNIT or BUREAU		
	uck 20		
	SUBJECT		
	Fire Box 11-7	(512 S. Macon St)	

TO: Mr. William J. Goodwin, Jr.,
Chief of Fire Department

DATE: October 10, 2006

Respectfully report that when we arrived on the scene I started to put the 100 foot ladder to the roof. After I put the ladder in place, I went back to the cab of the truck to get my S.C.B.A.. Then I went to the roof, as I was reaching I saw a fire fighter role out from the door. there was other fire fighters there to help him and I went to open the roof and opened the ski lights. There was fire showing out of the back windows comming up to the roof. I opened the first ski light I got to, then the next. It was fire coming out of the ski light at the back of the building. Then I started the saw and began to cut a hole infront of the first ski light. The fire worked it's way back to that ski light and started to blow hot, and I could not complete . I started back down the ladder to my officer, who had me go get a 1 3/4" line to. I did that and then put a line in the front window. I was in many other fire fighting duties.


COMMENTS:

NOTED: JMO, BC-IL

SIGNATURE: ^{EVO} *Joe R. Evans* T-20 AH

SIGNATURE: *John M. Baker*
Battalion Chief No. 12 10-10-06

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<i>Suzanne B. Allen</i> Division Chief	<i>John M. Baker</i> Deputy Chief	<i>John M. Baker</i> Chief of Fire Department
28-2100-0032 <i>Noted</i>	<input type="checkbox"/> Operations <input type="checkbox"/> Administration	1400-10-57

F C M	NAME & TITLE BRANDON PARKER FIRE FIGHTER APPRENTICE	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
	UNIT OR BUREAU TRUCK 20 A-6		
	SUBJECT FIRE BOX 11-7		

TO MR. WILLIAM S. GOODWIN, JR.
CHIEF OF FIRE DEPARTMENT

Date: OCTOBER 10, 2006

RESPECTFULLY REPORT WE RECEIVED BOX 11-7 AT 0222. WHEN WE ARRIVED ON THE SCENE, I THREW A LADDER (24 FOOT) TO THE SECOND FLOOR OF THE MAIN DWELLING. I HAD ON FULL TURN OUT GEAR. AFTER LARRY, THE EUD VENTILATED THE SECOND AND FIRST FLOOR WINDOWS, I PUT ON MY SCBA. AT THAT POINT I SAW FIRE FIGHTERS TEARING DOWN THE FRONT DOOR. FIRE FIGHTERS TUMBLED OUT, SOME OF THEM INJURED. I ENTERED THE DWELLING IN ATTEMPT TO SEARCH AND VENTILATE. I SAW THE BLACKEST THICKEST SMOKE I'VE EVER SEEN. THE TEMPERATURE WAS UNBAREABLY HOT AND AFTER ABOUT 30 SECONDS I BACKED OUT. I ENTERED THE DWELLING TO THE LEFT AND VENTILATED WINDOWS ON THE FIRST FLOOR, SECOND FLOOR AND BASEMENT. I CONTINUED TO PULL CEILINGS IN THAT DWELLING UNTIL MY BOTTLE RAN OUT.

SIGNATURE:

Brandon Parker

COMMENTS: NOTED JMA, 10-12

Signature:

John M. Baker

Battalion Chief No. 12 10-10-06

Forwarded ☒ Approved ☐ Disapproved ☐

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Disapproved ☐


Forwarded ☐ Approved ☐ Disapproved ☐

Disapproved ☐

Stephen B. Ward
DIVISION CHIEF

Assistant Chief

Chief of Fire Dept.

F P C M	NAME & TITLE Lawrence Korycki Jr. #2, Emergency Vehicle Driver	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
	UNIT OR BUREAU Truck 20		
	SUBJECT Fire Box 11-7 512 S. Macon St.		

TO Mr. William Goodwin Jr.
Chief of Fire Department

Date: October 10, 2006

Respectfully report that upon arriving on Fire Box 11-7 (512 S. Macon St.) we found heavy smoke conditions at that location. I immediately deployed a 24 FT. ground ladder to the second floor window (while wearing full protective clothing) and began ventilating windows.

I then returned to the truck to don SCBA and proceeded to ventilate first floor window (Members were attempting to advance an attack line through front door at this time).

With safety of SCBA I was then able to climb ladder and complete second floor ventilation. Upon reaching the ground I heard Battalion Chief One order evacuation of the fire building.

SIGNATURE:

COMMENTS:

Signature: _____

Battalion Chief No. _____

Forwarded ☐ Approved ☐ Disapproved ☐

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Approved ☐ Disapproved ☐


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Approved ☐ Disapproved ☐

Shift Commander

Assistant Chief

Chief of Fire Dept.

F I R E D E P A R T M E N T	NAME & TITLE	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
	UNIT OR BUREAU		
	SUBJECT		

TO _____ Date: _____

I saw one member lunge out of the front door, and the door suddenly closed (as if blown shut) the fleeing member then said "there's still three people in there!"

I then assisted several other members to attempt to open the door by kicking, thrusting and chopping (with an ax) at the door. With great effort we finally succeeded and began to pull trapped members out.

Once I saw that other members were providing care to the victims I manned an attack line directing the stream through the second floor windows by orders of BC I. After being relieved on the line, I entered exposure B in order to check for extension.

SIGNATURE: *EW Faulkner T-20 1/2*

COMMENTS: *NOTED: JMD, OCH*

Signature: *John M. Saks*
Battalion Chief No. 12 10-1006

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Approved ☐ Disapproved ☐

Sugary B. [Signature]
noted DIVISION CHIEF 2

Assistant Chief

Chief of Fire Dept.

F R M	NAME & TITLE	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
	Jeffery Jakelski, Captain A/3		
	UNIT or BUREAU		
	Truck 3		
	SUBJECT		
	Dwelling Fire, 512 S Macon St., 10-10-2006		

TO: **Mr. William J. Goodwin, Jr.,**
Chief of Fire Department

DATE: 10-10-2006

Respectfully report that on 10-10-2006, at 0212 hrs., Truck 3 was dispatched to 512 S Macon St for a dwelling fire. My self and the members of Truck 3 went to the rear of the fire building to perform operations. Upon our arrival, we found heavy fire conditions in the rear with all 3 floors involved. We assisted engine companies with advancing hose lines and began ladder and ventilation procedures. Due to arching wires and heavy fire, we laddered the exposure on side "D" and vented the windows and roof. We continued on the roof and eventually put a hose line in service on the roof after members were cleared from the inside. All members of Truck 3 were in full turnout gear and all safety equipment was in place.

COMMENTS:

NOTED: JMB, BEIC

SIGNATURE:

Captain Jeffery Jakelski
A/3

SIGNATURE:

John M. Baker

Battalion Chief No. 1C 10-10-06

Forwarded ☒ Approved ☐ Disapproved ☐

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Sgt. B. Wan
Division Chief

Deputy Chief

Chief of Fire Department


☐ Operations ☐ Administration

1400-10-57

28-2100-0032

Noted

2 10/12/06

F R M	NAME & TITLE	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
	Aaron Wodka Firefighter/Paramedic		
	UNIT or BUREAU		
	Truck 3, A/1		
	SUBJECT		
	Dwelling Fire 512 S. Macon St.		

TO: **Mr. William J. Goodwin, Jr.,**
Chief of Fire Department

DATE: October 10, 2006


I respectfully report that upon arrival at the fireground, members of Truck 3 reported to the rear or the building with full personal protective equipment, ground ladders, and hand tools. Ventilation and entry efforts were severely hindered due to heavy fire and electrical conditions.

COMMENTS: *NOTED: JMB, BG/K*

SIGNATURE: *FFPM Aaron M. Wodka T-3, A/1*

Forwarded <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved <input type="checkbox"/>	Forwarded <input type="checkbox"/> Approved <input type="checkbox"/> Disapproved <input type="checkbox"/>	Forwarded <input type="checkbox"/> Approved <input type="checkbox"/> Disapproved <input type="checkbox"/>
<i>Superior</i> Division Chief	Deputy Chief	Chief of Fire Department
<i>2</i>	<input type="checkbox"/> Operations <input type="checkbox"/> Administration	1400-10-57

28-2100-0012 *10/12/06*

F R M	NAME & TITLE	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
	Chris Kempisty, FPA A/2		
	UNIT or BUREAU		
	Truck 20		
	SUBJECT		
	512 S Macon St		

TO: **Mr. William J. Goodwin, Jr.,**
Chief of Fire Department

DATE: 10-10-2006

I respectfully report that upon arrival at the fireground, myself and members of T-3 reported to the rear of the building to perform ventilation and throw ladders. We also helped engine companies with hose lines. Entry to the fire building was hindered due to heavy fire, smoke and arching wires.


COMMENTS:

NOTED: JMB, BC-1C

SIGNATURE: *FPA Chris Kempisty F20A*

SIGNATURE: *John M. Baker*
 Battalion Chief No. 1C 10-10-06

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<i>Sergey B. Wa</i> Division Chief	Deputy Chief <input type="checkbox"/> Operations <input type="checkbox"/> Administration	Chief of Fire Department
28-2100-0072 <i>Moted</i>	10/12/06	1400-10-57

F R M	NAME & TITLE MARK Fida E.V.D.	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
	UNIT OR BUREAU Truck Co. 3		
	SUBJECT Dwelling Fire 512 S. MACON ST.		

TO Mr. William J. Goodwin Jr.
Chief of Fire Department

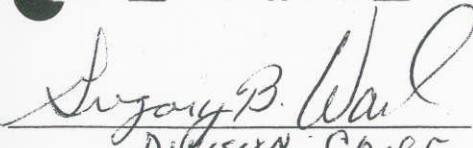
Date: 10/10/06

Respectfully report on Above dwelling Fire, I reported in full turnout gear AND tools to the rear of the Fire building. I helped in ventilation AND pull hose.

SIGNATURE: EVD Mark Fida TB, D4


COMMENTS: HOKED: JMB, BL-14

Signature: John M. Baker
Battalion Chief No. 10-10-06

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 Division Chief	Assistant Chief	Chief of Fire Dept.

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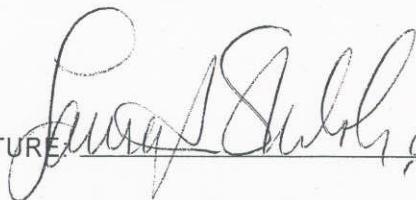
NAME & TITLE	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
UNIT OR BUREAU		
SUBJECT		

Laura A. Shiloh, Captain, A/3
Medical Division - EMS 5
Fireground - 512 South Macon Street

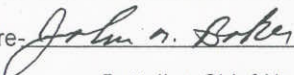
Date: October 10, 2006

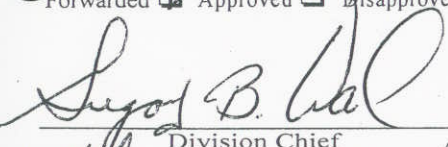
Mr. William J. Goodwin, Jr.,
Chief of Fire Department

Respectfully report that on October 10, 2006 at 0228 hours, I attached myself to a working fire with reports of people trapped. Upon my arrival I reported to the front of the building where I met Battalion Chief Reese Wingate, BC1A. He directed me to the crew of Medic 20 who were on the sidewalk. One civilian from the fire was sitting on a stretcher with a non-rebreather on his face, another civilian was sitting on the front steps and also appeared to be from the fire building. The crew of Medic 20 each had a burned firefighter as a patient that they were trying to get undressed. The burned firefighters were yelling that there was another member inside the fire building. I turned to see the third firefighter being pulled from the front door of the dwelling. He was placed on the sidewalk at my feet and was pulseless and apneic. After our initial immediate assessment, CPR was administered and Medic 10 arrived at the location. Care was continued and advanced life support was given. The firefighter was recognized as being Firefighter Allan Roberts who is assigned to Truck 26. I remained with the crew of Medic 10 and assisted with care of Firefighter Roberts. EMS 2 arrived on the scene prior to Medic 10's departure. I turned over medical command to Lt. William McCarren and proceeded to Johns Hopkins Bayview with Medic 10. Firefighter Roberts remained pulseless and apneic for the duration.

SIGNATURE:  CAT. 1B
10/10/06

COMMENTS: NOTED: JMB, BC1C

Signature: 
Battalion Chief No. 1C 10-1004

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 Deputy Chief		Chief of Fire Dept.

28-2100-0032
2 10/12/06
1400-10-57

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NAME & TITLE FF/PM Jennifer Muth A/3	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT
UNIT or BUREAU Medic 20	
SUBJECT Dwelling Fire 11-7	



TO: Mr. William J. Goodwin, Jr.,
Chief of Fire Department

DATE: October 10, 2006

Respectfully report responding to fire box 11-7, pulled up to the front of the dwelling saw occupant jumping out the window. Took equipment to front once there both occupants were standing down the street alittle claiming that they were ok. Both had smoke inhalation putting both of them on oxygen the gentleman that jumped claimed he was ok he landed on his butt and his butt hurt that was all. During that time members of the fire department were being pulled from the building. One member of squad 11 who was complaining of burns to his arms, and then the other from Engine 41 also complaining of burns to his arms. Both members were undressed and kept in the vacinity until other medics arrived, in the process another member of the fire department was being pulled from the building while undressing him medic 10 arrived on scene to care for him. All patients were taken to medic 20 to be treated and wait for other transport. Medic 2 then arrived and took both members with burns and medic 20 transported both occupants.

COMMENTS:

NOTED: JMB, DL-1C

SIGNATURE: *FF/PM Jennifer Muth A/3 10/10/06*


SIGNATURE: *John M. Baker* Battalion Chief No. 1C 10-10-06

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<i>Lugary B. Baker</i> Division Chief	Deputy Chief <input type="checkbox"/> Operations <input type="checkbox"/> Administration	Chief of Fire Department

28-2100-0052
Noted 2 10/12/06

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NAME & TITLE	Cheri Blount, A/1
UNIT or BUREAU	Medic 10
SUBJECT	Fire, 10/10/09

BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
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TO: Mr. William J. Goodwin, Jr.,
Chief of Fire Department

DATE: 10/10/06

Respectfully report that on 10/10/06 at 02:36 hours, I was dispatched to Macon Street and Eastern Avenue while working on Medic 10. We arrived on scene and were directed to proceed to the front of the residence for an injured firefighter. With assistance, our patient was quickly moved to the stretcher and placed inside Medic 10. We transported our pateint to Johns Hopkins Bayview Medical Center.

COMMENTS:

NOTED: JAD, DC-11

SIGNATURE:

Cheri Blount F.P.A. A/1
October 10, 2006

SIGNATURE:

John M. Baker

Battalion Chief No. 11 10-10-06

Forwarded ☒ Approved ☐ Disapproved ☐
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Division Chief

Deputy Chief

Chief of Fire Department


☐ Operations ☐ Administration

1400-10-57

28-2100-0034

2 10/12/06

Noted

F R M	NAME & TITLE	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
	Kara Simpson, A/4		
	UNIT or BUREAU		
	Medic 10		
	SUBJECT		
	Fire, 10/10/09		

TO: **Mr. William J. Goodwin, Jr.,**
Chief of Fire Department

DATE: 10/10/06

Respectfully report that on 10/10/06 at 02:36 hours, I was dispatched to Macon Street and Eastern Avenue while working on Medic 10. We arrived on scene and were directed to proceed to the front of the residence for an injured firefighter. With assistance, our patient was quickly moved to the stretcher and placed inside Medic 10. Our patient was then transported to Johns Hopkins Bayview Medical Center.


SIGNATURE: Kara Simpson, A/4 October 10, 2006

COMMENTS: NOTED: JMB, BEIC

SIGNATURE: John M. Baker
 Battalion Chief No. 16 10-10-06

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<u>Suzanne B. Ward</u> Division Chief	<u>Deputy Chief</u> <input type="checkbox"/> Operations <input type="checkbox"/> Administration	<u>Chief of Fire Department</u> 1400-10-57

28-2100-0032 2 10/12/06

F R O	NAME & TITLE Mary T. McElroy, Paramedic A/3	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
	UNIT OR BUREAU Medic 2		
	SUBJECT Fireground on Macon Street 10/10/06		

TO Mr. William Goodwin, Jr.
Chief of Fire Department

Date: October 10, 2006

Respectfully report that Medic 2 responded to the fireground on Macon Street and Eastern Avenue and staged at Eastern and Macon behind Medic 10. As we pulled up EMS 5 and the crew of medic 20 told us they were bringing 2 members who were burned to our unit. We received FPA James Butler of Squad 11 and Brandon Mattox of Engine 23 detailed to Engine 41 who had 2 degree burns to both hands. The scene was rather chaotic with multiple calls for the injured personnel.

After administering treatment on the scene both firefighters were transported to Bayview Burn Center as priority 2 patients. Our departure was aired over the fireground channel C1 and EMS2 McCarren acknowledged us and asked for us to give the patient information once we arrived at the hospital.

Respectfully submitted,

AS NOTED ABOVE -

H. Doyle McElroy #16 ESO
10/10/06

SIGNATURE: *McElroy A/3*

COMMENTS: *NOTED: JMD, BG/L*

Signature: *John M. Baker*

Battalion Chief No. *16* 10-10-06

Forwarded ☒ Approved ☐ Disapproved ☐

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Deputy Chief

Chief of Fire Dept.


1400-10-57

28-2100-9032

Division Chief *2*

10/12/06

Sgt. B. Wal
Notes

F R O	NAME & TITLE Julie Snyder, FFPM A/6	BALTIMORE CITY FIRE DEPARTMENT SPECIAL REPORT	
	UNIT OR BUREAU Medic 2		
	SUBJECT Fireground on Macon Street 10/10/06		

TO Mr. William Goodwin, Jr.
Chief of Fire Department

Date: October 10, 2006

Respectfully report that Medic 2 responded to the fireground on Macon Street and Eastern Avenue and staged at Eastern and Macon behind Medic 10. As we pulled up EMS 5 and the crew of medic 20 told us they were bringing 2 members who were burned to our unit. We received FPA James Butler of Squad 11 and Brandon Mattox of Engine 23 detailed to Engine 41 who had 2 degree burns to both hands. The scene was rather chaotic with multiple calls for the injured personnel.

After administering treatment on the scene both firefighters were transported to Bayview Burn Center as priority 2 patients. Our departure was aired over the fireground channel C1 and EMS2 McCarren acknowledged us and asked for us to give the patient information once we arrived at the hospital.

Respectfully submitted,

AS NOTED ABOVE -

St. Dejean McCarren A/6, E50
10/10/06

SIGNATURE: *FF/PM Snyder A/6*

COMMENTS: *NOTED JMB, BEIL*

Signature: *John M. Baker*
Battalion Chief No. *10-10-06*

Forwarded ☒ Approved ☐ Disapproved ☐

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Forwarded ☐ Approved ☐ Disapproved ☐

Sgt. B. Lee
Division Chief 2

Deputy Chief

Chief of Fire Dept.

1400-10-57

28-2100-0037

10/12/06

Noted

Appendix S

NIOSH Reports on Fire Fighter Deaths – Washington, D.C. & California



NIOSH
Fire Fighter Fatality Investigation
and Prevention Program

Death in the line of duty...

A summary of a NIOSH fire fighter fatality investigation

March 27, 2000

Floor Collapse Claims the Life of One Fire Fighter and Injures Two-California

SUMMARY

On January 10, 1999, three fire fighters became trapped when the second floor of a nightclub collapsed during an interior fire attack. One male fire fighter (the victim) died and two other fire fighters were injured as they battled the late morning blaze. Arriving on the scene of a two-story taxpayer building (commercial occupancy on the first-floor and living quarters on the second), fire fighters reported heavy smoke emitting from the second-floor windows and eaves with fire showing in a secondary front doorway that lead to the second-floor. The fire quickly spread up the walls of the first-floor to an area above the false ceiling over the first-floor. The fire also spread up the walls to the attic area above the second-floor.

As fire fighters prepared entry through the main front door, other fire fighters began applying water to the fire that was emitting through a secondary front door that led to the second-floor. Gaining entry through the main front door, two fire fighters from Engines 2550 (a Captain and a fire fighter) and three fire fighters from Engine 2552 (Lieutenant [injured], Engineer, and a fire fighter [victim]) advanced two 1 ½ -inch charged lines and began applying water to the fire. Upon entering the smoke filled structure, they noticed that the ceiling (drywall drop ceiling) was down in some areas, and they could see fire going up the walls and across the ceiling. As fire fighters from Engine 2552 advanced their line, the Engineer was struck in the head by falling debris that knocked off his helmet and he was forced to exit. Minutes later, a third fire fighter from Engine 2550 joined his crew inside the structure. A fire fighter (injured) from Engine 2552 also entered at the same time, relieving the victim on his line. The Captain on Engine 2550 stated that as he continuously surveyed the interior conditions, it had appeared to him there had been a partial roof collapse (referring to the second-floor as the roof). He then exited the structure and went to the command post to give the Incident Commander (IC) a report on the interior conditions, explaining that he felt there had been partial roof collapse (second-floor). Before the IC could make any changes, the Captain returned to the interior of the structure to find his crew. Just as he located his crew, the second floor collapsed, trapping three fire fighters from Engine 2552. The Captain of Engine 2550 and his crew escaped without injury. The rescue team quickly freed one fire fighter and had to use hydraulic jacks, airbags and cribbing to free the Lieutenant and the victim. All 3 fire fighters were transported to a local hospital where the victim was pronounced dead.

NIOSH investigators concluded that, to minimize the risk of similar occurrences, fire departments should:

- ***use extreme caution and recognize potential hazards that could exist when fighting a fire in a balloon-framed structure***

- *implement an emergency notification system to rapidly warn all persons who might be in danger if an imminent hazard is identified or if a change in strategy is made*
- *ensure that fire fighters wear protective clothing whenever they are exposed or potentially exposed to hazards*
- *ensure that a separate Incident Safety Officer, independent from the Incident Commander, is appointed*
- *ensure that when fire fighters are performing an interior attack with the possibility of a ceiling collapse, they should establish a collapse shelter*
- *provide the Incident Commander with a Command Aide*
- *ensure that once a Rapid Intervention Team (RIT) is established that they remain the RIT throughout the operation*
- *develop and implement a preventative maintenance program to ensure that all SCBA's are adequately maintained*

Additionally building owners should:

- *ensure that all modifications/renovations to buildings are in compliance with current building codes (i.e., any renovation or remodeling does not decrease the structural integrity of supporting members).*



Incident Scene

INTRODUCTION

On January 10, 1999, a 52-year-old male fire fighter (the victim) died and two fire fighters were injured during an interior fire attack at a nightclub, which was part of a two-story taxpayer building. As the fire fighters applied water from the roofs of the adjoining structures, two crews entered the first-floor to perform an interior attack. During the fire attack, the second-floor collapsed, trapping three fire fighters. All three fire fighters had to be extricated from the debris. The three fire fighters were transported to the local hospital, where two of the fire fighters were treated for their injuries and the victim was pronounced dead.

The National Institute for Occupational Safety and Health (NIOSH) was notified of the incident by the International Association of Fire Fighters (IAFF) and the United States Fire Administration on January 13, 1999. On February 25-26, 1999, a Safety and Occupational Health Specialist, an Engineer, and a Physical Scientist traveled to California to investigate the circumstances surrounding this fatal incident. Meetings were conducted with the Chief, Assistant Chiefs, Battalion Chiefs, the City building inspector, the department photographer, IAFF union representatives, representatives from the department's air-mask shop, and the fire fighters involved in the incident. NIOSH investigators obtained a copy of the department's Standard Operating Procedures (SOPs), photographs of the fire scene, the victim's training record, the Incident Commander's incident scene assignment sheet, maintenance records for the self-contained breathing apparatus (SCBA), interview statements from the department's internal investigation, a videotape from the fire scene, and the dispatch tapes. Training procedures and preliminary reports were reviewed. Investigators visited the site and photographs were taken. The department sent four SCBAs (the victim's and three others involved in this incident) to the NIOSH respirator certification laboratories for further evaluation. The evaluation completed by NIOSH indicated the victim's SCBA was working properly ([see Attachment 1](#)).⁸

The fire department involved in the incident serves a population of 380,000 in a geographical area of 72 square miles. The fire department is comprised of approximately 525 employees, of whom 475 are uniformed personnel. The fire department provides all new fire fighters with the basics of Fire Fighter level I training. The department requires all fire fighters to attend 16 weeks at the City Fire Academy, to complete Emergency Medical Technician (EMT) training provided in the Fire Fighter level I training, and to be State-certified. All new fire fighters are placed on a 18-month probation period. Throughout the probation period, they train and complete the Fire Fighter level II requirements. Refresher training courses are continued on a day-by-day basis. The victim's training records were reviewed and appeared to be sufficient and up to date. The victim had 29-years of experience as a fire fighter.

INVESTIGATION

On January 10, 1999, at 1043 hours, fire fighters responded to a dispatch report of a fire in a two-story building. The following were dispatched to respond:

Engine 2550 (Captain, Engineer, and 2 fire fighters)

Engine 2552 (Lieutenant [injured], Engineer, fire fighter [injured], and fire fighter [victim])

Engine 2545 (Captain, Engineer, and 2 fire fighters)

Engine 2548 (Captain, Engineer, and 2 fire fighters)

Engine 2555 (Lieutenant, Engineer, and 2 fire fighters)

Truck 2574 (Captain and 4 fire fighters)

Battalion Chief 2512 (BC)

At 1046 hours, Truck 2574 was the first to arrive on the scene and reported heavy smoke was emitting from a two-story building (see [Photo](#)). Dispatch also made a report that they had received calls stating that civilians were trapped on the second-floor of the burning structure. Truck 2574 established Command and requested a second alarm. Battalion Chief 2512 arrived on the scene and assumed command. He immediately struck a third alarm and shortly after struck a fourth alarm because there were buildings adjoining the burning structure and he wanted to control the fire from spreading (see [Photo](#)). Engines 2550 and 2545 arrived on the scene shortly after. Engine 2550 hooked up a 2 ½ -inch line to a nearby hydrant and proceeded to the burning structure as Engine 2545 hooked up a 5-inch supply line to the hydrant. Engine 2550 and Engine 2545 pulled two 1½-inch attack lines and took position at exposure A (see [Diagram](#)). Engine 2548 arrived on the scene and set up in the rear of the structure at exposure C and side D, while Truck 2574 placed their aerial ladder to exposure C. Engine 2548's original assignment was to act as the Rapid Intervention Team (RIT), but as they arrived at 1051 hours, they requested to set up in the rear due to the amount of apparatus already in the front. At 1052 hours, Battalion Chief-2514 arrived and was assigned to be in charge of Outside Operations. He immediately proceeded to side D and then to exposure A, to complete a size up of the structure.

The "bird dog" (fire fighter who makes forcible entry) on Truck 2574 began forcible entry at exposure C. Engine 2542 arrived on the scene to assist with SCBA operations (changing and filling air bottles) while Special Truck 2592 arrived and proceeded to the command post to assist the IC with operations and to collect Pass Ports (accountability system). At 1056 hours, Engine 2552 arrived and the IC placed them at exposure A to take over as the RIT team.

Truck 2571 arrived on the scene and placed their aerial ladder to the roof of the adjoining structures on side D. Two fire fighters went to the roof to cut vent holes as the "bird dog" on Truck 2571 prepared entry at the main front door of exposure A. Truck 2571 had also placed two 1 ½-inch lines on the roof of side D to control the fire from spreading to the adjoining structures. Fire fighters on the adjoining roofs were also applying water down the exterior walls of the structure in an attempt to reach the fire coming up the walls.

The Captain from Engine 2545 and a fire fighter from Engine 2555 entered the secondary front door, which lead to the second-floor (see [Photo](#)). As the two proceeded up the steps with the Captain on the nozzle, the steps collapsed, and the Captain and fire fighter retreated and exited the structure. The Captain reported to the IC that there was heavy fire near the stairs and that they could not access the second-floor. The Captain ordered a fire fighter from Engine 2545 to retrieve an axe and break loose the steps so they could proceed under them to the rear of the structure. After the steps were knocked out, the Captain and two fire fighters from Engine 2545 and a fire fighter from Engine 2555 entered the area applying water and proceeded toward the rear of the structure approximately 35-feet where they encountered a gas furnace. The furnace was blocking the fire fighters path to the rear of the structure, so they decided to remove the furnace and drag it to the exterior. *[NOTE: The furnace is believed to be the fire's point of origin. When the fire fighters removed the furnace they ripped all connections apart; however, the gas company had shut off the gas prior to the furnace's removal.]* The fire fighters reentered the structure and proceeded approximately 5-feet past the original position of the furnace

where they remained applying water to the interior of the bar area (see [Diagram](#)) throughout the fire attack.

After entry was made, fire fighters from Engine 2550 began to advance the attack line through the main front door while fire fighters from Engine 2552 requested permission to back up 2550. The IC ordered Engine 2552 to back up Engine 2550 and ordered Engine 2556, which had just arrived on the scene, to act as the RIT. Engine 2550 (Captain and fire fighter) and Engine 2552 (Lieutenant, Engineer, and fire fighter) advanced two 1 ½ -inch lines through the main front door. Engine 2550 began applying water to the fire on the left side near the bar as Engine 2552 proceeded down the right wall. Fire fighters stated that the interior was dark and smoke-filled, with moderate heat. They stated that fire was visible in the rear of the structure, rolling up the walls and across the ceiling. The Engineer on Engine 2552's line was struck in the head by an unknown object, which knocked his helmet to the ground. When he could not locate his helmet, he passed the nozzle to the victim and exited the structure. The fourth fire fighter from Engine 2552 had just arrived on the scene (by a privately owned vehicle), and met up with the Engineer who had just exited the structure. After a short discussion with him, she entered through the main front door to join her crew. After joining her crew, she relieved the victim of his position on the line and thought that he was exiting the structure.

A fire fighter from Engine 2550 entered and joined his crew as the Captain surveyed the interior conditions, noticing what he thought to be a partial roof (which was actually the second-floor) collapse. The Captain exited the structure to relay interior conditions to the IC. He also told the IC that no civilians were located on the first floor. The Captain then reentered the structure to find his crew and order them out.

The fire fighter from Engine 2552 who relieved the victim stated that conditions were improving and they thought that the fire was under control. As the fire fighters backed up the Lieutenant on the line, they spotted a small spot fire overhead. The Lieutenant opened the line on the fire and it appeared the fire was out. Shortly after he shut down the nozzle, the second-floor collapsed on top of them, pinning them to the floor. The Captain from Engine 2550 located his crew and ordered them to exit as the collapse occurred. The Captain and his crew were able to escape the collapse without injury. Prior to the collapse, the IC was preparing to radio the interior crews to direct them to the exit and continue the attack on the exterior. *[NOTE: The City Building Inspector stated the structure was built in 1890. The structure was balloon-framed with 2-inch by 10-inch lumber for floor joists. The floor joists spanned from side B to side D (approximately 26 feet), were spaced on 16-inch centers, and nailed directly to the sides of the 2-inch by 4-inch wall studs. The wall studs stretched from the first floor to the roof line with no headers or top plates separating the two floors. The structure had been remodeled several times, the last in 1986, when it was remodeled as a nightclub. A new furnace had been installed in an area where structural supports had been cut out. The wall studs had been cut and removed from the floor to the ceiling of the first-floor to provide an opening for the furnace. The removed studs had never been replaced, weakening the floor above. Additionally, fire stops were not present in the wall studs, allowing the fire to spread rapidly.]*

The IC received several calls from fire fighters stating that there had been a roof (second-floor) collapse and that fire fighters were trapped inside. The IC responded by directing the Outside Operations Chief to evaluate conditions and direct the RIT during rescue operations. He then ordered all outside suppression to be at a minimum during rescue operations. The fire fighters from Engine 2550, who were positioned along the bar when the collapse occurred, escaped without injury because the bar had created a collapse shelter between the second-floor debris and the first-floor. All three fire fighters from Engine 2552 (Lieutenant [injured], fire fighter [injured] and fire fighter [victim]) were trapped under the debris of the collapse.

Immediately after the collapse, a fire fighter from Truck 2571 had just came off the roof to move the aerial ladder when he heard the call of trapped fire fighters. He immediately went to the front door of exposure A and assisted the RIT (Engine 2553) in the search (Engine 2553 had arrived on the fourth alarm and taken over as the RIT). At that time the Outside Operations Chief replaced the RIT of Engine 2553 with the Heavy Rescue team (Truck 2571). The IC then ordered a roll-call. *[NOTE: The Heavy Rescue team was composed of a Lieutenant and 4 fire fighters that had completed training in heavy rescue procedures. The training consisted of 40 hours of confined space training, the proper use of airbags, extrication equipment, hydraulic jacks, repelling, and search and rescue techniques.]* Also assisting the Heavy Rescue team were the Outside Operations Chief, the Captain from Engine 2553, and the Captain from Engine 2541. The Safety Officer had arrived at this time and also assisted in the rescue by continuously evaluating the structure's stability.

The fire fighter from the Heavy Rescue team who entered the structure first spotted one of the three fire fighters approximately 15-feet inside the front door (see [Diagram](#)). After working his way through debris, he cut off the trapped fire fighter's SCBA, freeing her from the debris. The fire fighter then located the Lieutenant, who was approximately 5-feet away. As he moved the debris to reach him, the Lieutenant and fire fighters from the Heavy Rescue team retrieved airbags, hydraulic jacks, and cribbing needed to extricate the Lieutenant and the victim. They placed an airbag and cribbing under the debris to free the trapped Lieutenant. As they began to place a second airbag under the debris, they realized the regulator was not working, so they used the hydraulic jacks, which required additional time. Approximately 10 minutes after they reached the injured Lieutenant, they freed him and removed him to the exterior. Approximately 4 minutes later the victim was reached. The victim was found in a crouched position and heavy timbers from the second floor were applying constant pressure. The victim was unresponsive throughout the entire rescue. When they reached the victim, a pulse was not detected. Using the hydraulic jacks and cribbing, the Heavy Rescue team freed the victim and immediately started Cardiopulmonary Resuscitation. The victim was removed and transported to a local hospital where he was pronounced dead. The injured Lieutenant and fire fighter were also transported to a local hospital. They were treated for their injuries and released for further rehabilitation.

CAUSE OF DEATH

According to the medical examiner, the cause of death was listed as traumatic asphyxiation.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Fire fighters should use extreme caution and recognize potential hazards that could exist when fighting a fire in a balloon-framed structure. ^{1, 2}

Discussion: The vertical combustion spaces between the wall studs in balloon-frame construction provide a channel for the rapid spread of fire from floor to floor. Once fire spreads into the stud space or if the fire should originate in the stud space, it can readily spread from the vertical cavity into the horizontal joists and into the attic space. Therefore, a fire in a balloon-frame building is generally more difficult to control than one in a platform-frame building. When the fire spreads up the walls and under joists, the structure strength becomes a serious concern. Officers and the IC should always take this into consideration when completing a size-up of conditions. During the size-up, it should be determined what type of structure is involved and made clear to all fire fighters. The engineering firm that investigated

this incident stated in their report that the building fit the literal definition of a firetrap.¹; (A place, especially a building, so constructed as to make egress hazardous in case of fire, *Webster's New Collegiate Dictionary*.)

Recommendation #2: Fire departments should implement an emergency notification system to rapidly warn all persons who might be in danger if an imminent hazard is identified or if a change in strategy is made.^{3, 4}

Discussion: There is a difference between withdrawing fire fighters and calling for an emergency evacuation of fire fighters. A normal withdraw action is ordered when a fire is spreading beyond the ability of fire fighters' control. An emergency evacuation is ordered when an extremely serious emergency has occurred or is about to happen, such as a missing fire fighter(s), explosion, or collapse. In an emergency evacuation, unlike a withdrawal, fire department tools and hoses are left behind and a roll call or a head count must be conducted as there may be a missing fire fighter. An emergency evacuation is a rare occurrence in the fire service, and because of its rarity confusion and delay may occur when it is ordered. For this reason, there should be a prearranged signal, tone, or sound to alert fire fighters of an emergency withdraw; fire departments should train their members for an emergency evacuation upon receipt of the signal. Fire fighters should immediately exit the structure upon receipt of the prearranged signal, leaving behind tools and equipment, which can be removed later. If fire fighters are performing an interior attack with the possibility of a ceiling collapse and hear the prearranged tone or signal, they should attempt to exit immediately. If fire fighters are unable to exit, they should attempt to establish a collapse shelter (see recommendation #5). Incident Commanders should use the prearranged emergency evacuation signal or tone whenever they decide conditions are unsafe for interior fire fighting or an emergency has occurred with a fire fighter.

Recommendation #3: Fire Departments should ensure that fire fighters wear protective clothing whenever they are exposed or potentially exposed to hazards.⁵

Discussion: Fire fighters performing fighting tasks should wear the appropriate personal protective equipment. Fire department's should provide each fire fighter with the appropriate protective clothing and protective equipment to provide protection from the hazards to which the fire fighter is or is likely to be exposed. Such protective clothing and protective equipment should be suitable for the tasks that the fire fighter is expected to perform. The fire fighters performing interior operations in this incident were wearing wool pants as a part of their turnout gear. It is optional in the department's SOPs to wear turnout pants. One of the injured fire fighter suffered a severe burn to one of his knees and is undergoing medical treatment and rehabilitation.

Recommendation #4: Fire departments should ensure that a separate Incident Safety Officer, independent from the Incident Commander, is appointed.⁴⁻⁶

Discussion: According to NFPA 1561, paragraph 4-1.1, "the Incident Commander shall be responsible for the overall coordination and direction of all activities at the incident. This shall include overall responsibility for the safety and health of all personnel and for other persons operating within the

incident management system." While the Incident Commander is in overall command at the scene, certain functions must be delegated to ensure adequate scene management is accomplished. An Incident Safety Officer should be appointed by the Incident Commander at an emergency scene. At an emergency incident where activities are judged by the Incident Safety Officer to be unsafe or to involve an imminent hazard, the Incident Safety Officer should have the authority to alter, suspend, or terminate those activities. The Incident Safety Officer shall immediately inform the Incident Commander of any actions taken to correct imminent hazards at the emergency scene.

Recommendation #5: Fire departments should ensure that when fire fighters are performing an interior attack with the possibility of a ceiling collapse, they should attempt to establish a collapse shelter.³

Discussion: *A fire fighter operating at a serious building fire with the possibility of a ceiling collapse should attempt to stay near large pieces of furniture or stock which can serve as shelters or voids if the ceiling collapses. An open floor area or empty store presents a dangerous environment because, if the ceiling collapses, a fire fighter operating below will be pinned to the floor and will receive the full impact of the heavy ceiling. Serving counters extending from the front entrance to the rear of structures have saved lives of fire fighters caught beneath collapsing ceilings.³* In this incident two crews entered to perform the interior attack. The crew from 2552 entered and went off to the right where there was no collapse shelter and the crew from 2550 entered to the left and proceeded along the bar (approximately 4 feet in height), which acted as a collapse shelter. When the collapse occurred, the crew of 2552 received the full impact of the heavy timbers from the second-floor. The crew from 2550 were knocked to the floor but were not trapped due to the bar which created a void between the collapsed debris and the floor and allowed them to escape.

Recommendation #6: Fire departments should provide the Incident Commander with a Command Aide.^{5, 7, 8}

Discussion: Aides are personnel assigned to assist the Incident Commander. During large operations, sector officers also may have aides to assist them. They do this by managing information and communications. They can keep track of assignments, locations, and the progress of companies, assist with tactical worksheets, or access reference materials and pre-fire plans. Another important function they may perform is to provide reconnaissance and operational details for the IC (his eyes and ears). Some jurisdictions assign full-time aides to command officers to perform routine administration functions and to act as drivers in addition to their fireground role. Departments should consider the aide to be an individual that has the experience and authority to conduct the required tasks.

In large metropolitan cities, Battalion Fire Chiefs are required to respond quickly to emergency incidents. In their response, they have to be fully aware of heavy traffic conditions, construction detours, traffic signals, and other conditions. Also during their response, they must monitor and comprehend which companies are responding, fire ground activity, fire conditions, and additional information from dispatch. If possible, they will also write down all incoming information from dispatch and the fire ground and make important decisions. Aides could provide the Battalion Fire Chief the opportunity to comprehend all information without distraction and complete the necessary tasks en route to the scene.

Recommendation #7: Fire Departments should ensure that once a Rapid Intervention Team (RIT) is established that they remain the RIT throughout the operation.⁵

Discussion: A RIT shall consist of at least two fire fighters and shall be available for rescue of a fire fighter or a crew if the need arises. The RIT shall be fully equipped with the appropriate protective clothing, protective equipment, SCBA, and any specialized rescue equipment that might be needed given the specifics of the operation under way. Once the RIT is established, they should remain the RIT throughout the operation. In this incident, a RIT was established as operations took place. Throughout the operations, the company serving as the RIT changed several times. After the collapse had occurred and rescue procedures took place, the RIT that entered to perform the rescue was replaced with the heavy rescue team.

Recommendation #8: Fire departments should develop and implement a preventative maintenance program to ensure that all SCBA's are adequately maintained.⁹

Note: Although there were no problems identified with the victim's SCBA, NIOSH additionally completed an evaluation of the department's SCBA maintenance program.

Discussion. Fire departments should establish respirator service and maintenance procedures and rigidly enforce them to provide respirators that are dependable and are constantly evaluated, tested, and maintained. Equally important is record keeping, a critical element of any respirator maintenance program. On February 26, 1999, NIOSH completed an evaluation of the departments SCBA program and issued a report ([see Attachment 1](#)).

Additionally, building owners should ensure that all modifications/renovations to buildings are in compliance with current building codes (i.e., any renovation or remodeling does not decrease the structural integrity of supporting members).

Discussion: Modifications, renovations, and remodeling of buildings require building permits to ensure all work done is in compliance with current building codes and does not decrease the structural integrity of supporting members. The structure involved in this fire incident had been remodeled and renovated several times in the past. For example, structural members had been moved or removed without appropriate restructuring or support, thereby creating a hazard for the occupants and fire fighters in case of a fire or other emergency. Specifically, wall supports were removed and never restructured, therefore weakening the second floor and roof above.

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- Fire Fighter Fatality Investigation Report F99-05 | CDC/NIOSH Page 16 of 17
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INVESTIGATOR INFORMATION

This incident was investigated by the following; Frank C. Washenitz II, Safety and Occupational Health Specialist, Division of Safety Research, Surveillance and Field Investigations Branch; Tim Merinar, Engineer; and Tom McDowell, Physical Scientist, Division of Respiratory Disease Studies, Respirator Branch.

Photo

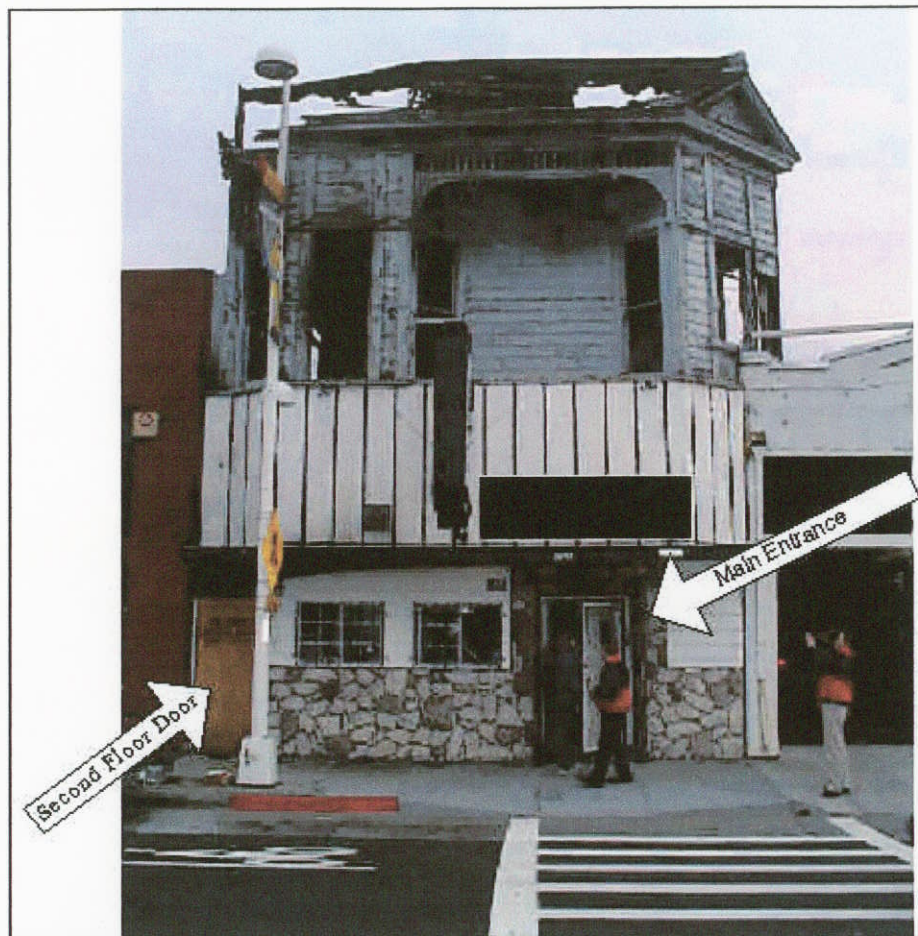
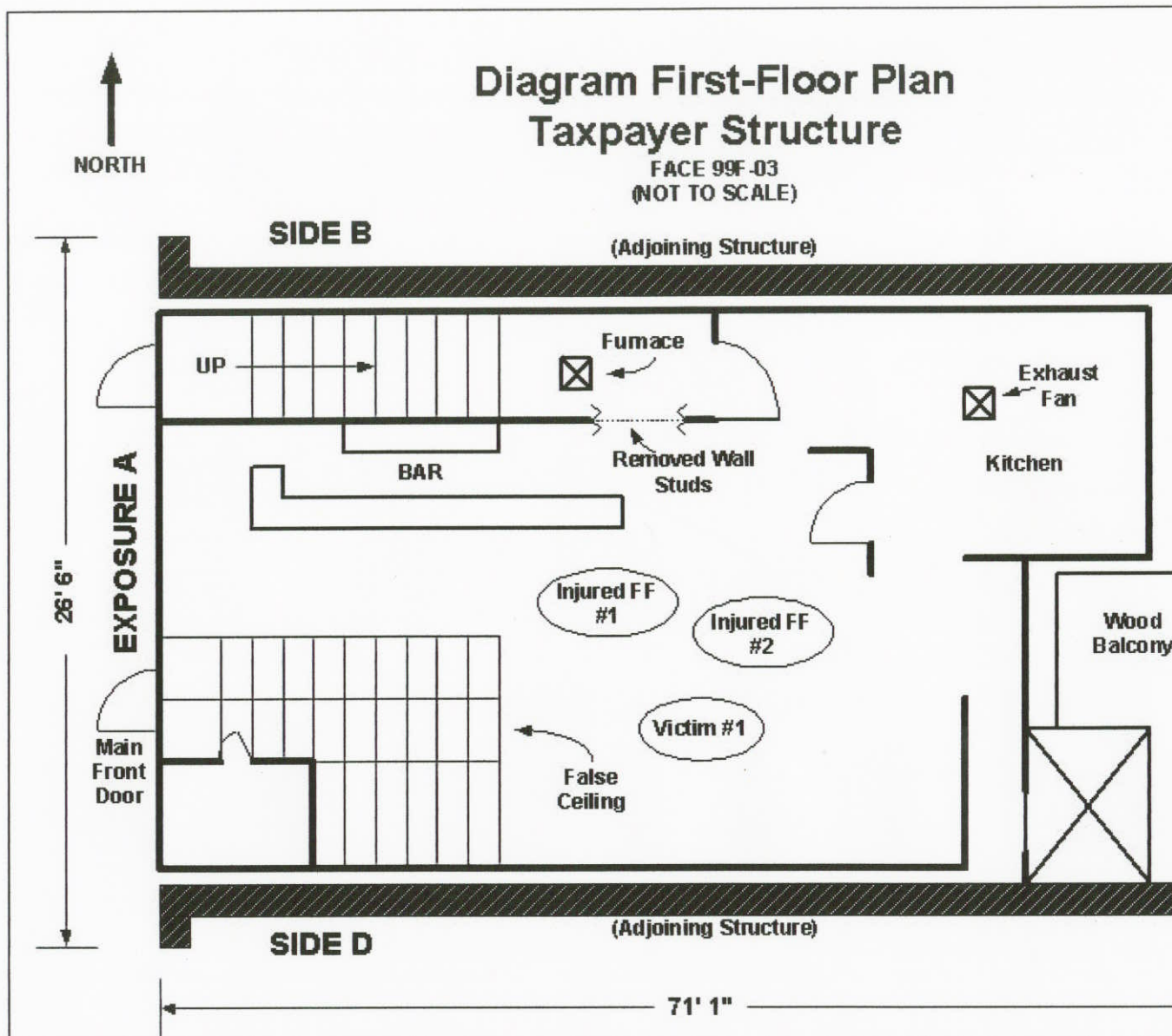


Photo: This photo depicts the two-story tax payers building (commercial occupancy on the first-floor and living quarters on the second).



Attachment 1

NIOSH SCBA Evaluation Report



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
and Prevention (CDC)
National Institute for Occupational
Safety and Health - ALOSH
1095 Willowdale Road
Morgantown, WV 26505-2888

PHONE: (304) 285-5907
FAX: (304) 285-6030

March 12, 1999

Mr. Don Parker
Assistant Chief
Oakland Fire Department
150 Frank H. Ogawa Plaza
Oakland, California 94610

Dear Mr. Parker:

During our recent visit to the Oakland Fire Department on February 26 and 27, 1999, Thomas McDowell and I had the opportunity to evaluate your fire department self-contained breathing apparatus (SCBA) maintenance program. One of the objectives of our visit was to evaluate your SCBA maintenance program and to make recommendations for improvement. This evaluation was conducted on February 27, 1999, and consisted of visiting the SCBA maintenance area, reviewing maintenance records, and discussions with available fire department personnel.

Your current SCBA maintenance program involves contracting with an independent vendor to perform SCBA repairs on-site on an as-needed basis. While the current SCBA repair work appears to be adequate to correct SCBA break-downs, we would like to offer the following recommendations which are based upon these recognized standards:

Title 29, Code of Federal Regulations (CFR) Part 1910.134 known as The OSHA Respirator Standard.

National Fire Protection Association (NFPA) 1404 Standard for a Fire Department Self-Contained Breathing Apparatus Program, 1996 Edition.

National Fire Protection Association (NFPA) 1500 Fire Department Occupational Safety and Health Program, 1997 Edition

1) The SCBA maintenance program should be under the direct control of one designated individual who is an Oakland Fire Department employee and who has no other fire fighting responsibility. However, due to cost considerations, staffing, and other issues, this is not always feasible at all departments and should be tailored to fit into each department's organizational structure.

Page 2 - Mr. Don Parker

Title 29, Code of Federal Regulations (CFR) Part 1910.134 (the OSHA Respirator Standard) at 1910.134(c) requires each respirator program to be administered by a suitably trained program administrator.

2) A preventative maintenance program should be established to ensure regularly scheduled preventative maintenance is conducted on each SCBA at least annually.

OSHA 1910.134(h) requires the employer to provide for the cleaning and disinfecting, storage, inspection, and repair of respirators used by employees.

NFPA 1404, Chapter 6-1.2 and 6-1.3 require annual inspection and servicing of SCBA by qualified personnel. *Chapter 6-1.3* requires annual servicing to be conducted following the manufacturer's recommendations and should include :

- a) Disassembly of the SCBA into major components
- b) Flow testing of the regulator
- c) Disassembly and cleaning of the regulator
- d) Replacement of worn parts, or those recommended by the manufacturer in the regulator assembly.
- e) Disassembly of the low-air alarm and cleaning and replacement of component parts as necessary.
- f) Cleaning and replacement of components of the facepiece and harness assembly, and replacement of component parts as necessary.
- g) Reassembly of the entire SCBA and testing for proper operation of all components.
- h) Proper recording of all performed maintenance on record keeping forms.

NFPA 1404, Chapter 6-2.1 specifies that a preventative maintenance program shall be established by the authority having jurisdiction for all SCBA used in the organization.

NFPA 1404, Chapter 6-2.2 specifies that the SCBA preventative maintenance program shall be conducted in order to prevent SCBA malfunction and failures of equipment during use.

3) Air quality analysis should be performed every 3 months and a certificate of compliance maintained at the filling station for all filling stations used to fill SCBA cylinders.

OSHA 1910.134(i)(1)(ii), NFPA 1500, Chapter 5-3.6, and NFPA 1404, Chapter 7-1.1 and Chapter 7-2.2 require that compressed air used to fill SCBA cylinders meet or exceed the requirements for Type 1-Grade D breathing air specified in the Compressed Gas Association (CGA) Commodity Specification for Air, G-7.1.

NFPA 1500, Chapter 5-3.7.1 and NFPA 1404, Chapter 7-1.2 specify that breathing air used to fill SCBA cylinders should be tested every 3 months by an accredited laboratory. *Chapter 7-1.3* specifies that records shall be maintained for each air quality test.

- 4) A preventative maintenance program should be established to cover the breathing air compressor, air purification filters, and other equipment used to generate breathing air.

OSHA 1910.134(i)(5), and *NFPA 1404, Chapter 7-2.12 thru Chapter 7-2.14* specify requirements for the operation and maintenance of breathing air compressors and cylinder fill stations.

- 5) Records should be maintained for each SCBA which contain the following information:

NFPA 1404, Chapter 2-2.3 specifies that an individual record of each SCBA regulator and harness assembly shall be maintained. This record shall include the inventory or serial number, date of purchase, date of manufacture, date placed into service, location, maintenance and repairs, replacement parts used, upgrading, and test performance.

NFPA 1404, Chapter 2-2.4 specifies that an individual record of each SCBA cylinder shall be maintained. This record shall include the inventory or serial number date of purchase, date of manufacture, date placed into service, location, hydrostatic test pressure and dates, and any inspection and repairs. The hydrostatic test dates shall appear on each cylinder according to the manufacturer's instructions and applicable government agencies.

NFPA 1404, Chapter 2-2.5 specifies that an individual record of each SCBA facepiece shall be maintained. This record shall include the inventory or serial number, date of purchase, location, maintenance and repairs, replacement parts, upgrading, and test performance.

NFPA 1500, Chapter 2-7.5 specifies that each fire department shall assure that inspection, maintenance, repair, and service records are maintained for all vehicles and equipment used for emergency operations and training.

These recommendations are based upon the premise that all SCBA are life-saving devices which will only perform as well as they are maintained. Since they are expected to function and perform properly each time they are used, it is important that SCBA maintenance and inspection be given the utmost priority at the department level.

Page 4 - Mr. Don Parker

I trust this information is beneficial to your needs. If you have any questions or require additional information, please contact me at (304) 285-5965.

Sincerely yours,

Timothy R. Merinar
General Engineer
Respirator Branch
Division of Respiratory Disease Studies

cc:
Capt. William Wittmer, Oakland FD
Frank Washenitz, NIOSH, DSR



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NIOSH
Fire Fighter Fatality Investigation
and Prevention Program

Death in the line of duty...

A summary of a NIOSH fire fighter fatality investigation

November 23, 1999

Two Fire Fighters Die and Two Are Injured in Townhouse Fire—District of Columbia

SUMMARY

On May 30, 1999, fire fighters responded to a box alarm involving a townhouse fire. The initial report came in as a house fire, and it was later reported that the fire was in the basement (all fire fighters did not receive the follow-up report of fire in the basement). Engine 26 (Lieutenant and 3 fire fighters) was the first to arrive on the scene and reported smoke showing on the front (side 1) of a row of townhouses (see Diagram 1). A fire fighter (Victim #1) from Engine 26 advanced a 1½-inch attack line through the front door (1st floor). Soon after, the layout man from Engine 26 entered to back up Victim #1. Engine 17 (Lieutenant and 3 fire fighters) arrived shortly after and stretched a 350-foot 1½-inch hose line to the rear (side 3) (see Diagram 1). Truck 15 (Captain and 3 fire fighters) arrived on the scene and began ventilation on the front. Truck 4 (Lieutenant and 3 fire fighters), responding for Truck 13 (out of service), arrived later and began ventilation in the rear. Engine 10 (Lieutenant, Victim #2, and 2 fire fighters) arrived on the scene as the third-due engine and backed up Engine 26 on side 1. Engine 12 arrived as the fourth-due engine and proceeded to side 1 of the building. Battalion Chief 1 (the Incident Commander [IC]) and Rescue 1 (Lieutenant and 4 fire fighters) also responded as a part of the box alarm.

Engine 26 and Engine 10 advanced their lines through the front door in a search for the fire and the basement door (at the top of the basement steps). As the two crews searched, Truck 4 made forcible entry through a sliding-glass door in the rear (basement entrance door at ground level). Engine 17 (at the basement door with a charged line) reported to the IC that they were on the first floor, in the rear, with a small fire showing (Engine 17 was actually at the basement level). Engine 17 radioed the IC for permission to open their line and knock down the fire. Knowing that he had two engine crews on the first floor in the front, the IC denied Engine 17's request until he could locate the interior crews' positions. He radioed the officer from Engine 26 several times for their position, but received no response.

Engine 17 asked a second time for permission to hit the fire, as it began to grow. The IC denied the request a second time and again tried unsuccessfully to radio the officer from Engine 26. Conditions in the interior rapidly deteriorated, forcing the fire fighters on the first floor to search for an exit. A fire fighter in the interior recalled seeing fire appear from a doorway on the first floor. After seeing the fire, the fire fighter stated that everything went black and he felt an intense blast of heat. Victim #1 and Victim #2 were unable to escape, while the Lieutenant and a fire fighter from Engine 26 escaped with severe burns. All injured fire fighters were transported to a local hospital. The Lieutenant and fire fighter were admitted with burn injuries. Victim #1 was treated for severe burns and was pronounced dead the following day. Victim #2 was pronounced dead on arrival at the hospital.

NIOSH investigators concluded that, to minimize the risk of similar incidents, fire departments should:

- *ensure that the department's Standard Operating Procedures (SOPs) are followed and refresher training is provided*
- *provide the Incident Commander with a Command Aide*
- *ensure that fire fighters from the ventilation crew and the attack crew coordinate their efforts*
- *ensure that when a piece of equipment is taken out of service, appropriate back up equipment is identified and readily available*
- *ensure that personnel equipped with a radio position the radio to receive and respond to radio transmissions*
- *consider using a radio communication system that is equipped with an emergency signal button, is reliable, and does not produce interference*
- *ensure that all companies responding are aware of any follow-up reports from dispatch*
- *ensure that a Rapid Intervention Team is established and in position immediately upon arrival*
- *ensure that any hose line taken into the structure remains inside until all crews have exited*
- *consider providing all fire fighters with a Personal Alert Safety System (PASS) integrated into their Self-Contained Breathing Apparatus (SCBA)*
- *develop and implement a preventive maintenance program to ensure that all SCBAs are adequately maintained.*

INTRODUCTION

On May 30, 1999, two fire fighters died and two were injured while battling a townhouse basement fire. Two fire fighters—Victim #1, a 30-year-old nozzleman from Engine 26, and Victim #2, a 29-year-old nozzleman from Engine 10—had to be rescued when interior crews were hit by an intense blast of heat and flames. Victim #1 was rescued and transported to a nearby hospital where he was pronounced dead the following day. Victim #2 was rescued and pronounced dead on arrival at the hospital.

On June 1, 1999, the International Association of Fire Fighters notified NIOSH of the incident, and on June 21, 1999, a Safety and Occupational Health Specialist, the Senior Investigator, and the Team Leader of the NIOSH Fire Fighter Fatality Investigation and Prevention Program, initially investigated this incident. On July 21, 1999, a Safety and Occupational Health Specialist and a Safety Engineer conducted additional interviews. An Engineer and a Physical Scientist from NIOSH also completed an evaluation of the department's SCBA maintenance program on July 21, 1999. On August 31, 1999, a Safety and Occupational Health Specialist returned to interview the seriously injured fire fighter. Meetings and interviews were conducted with: the Chief, the Assistant Chief, the two Battalion Chiefs on the scene (one of whom was the Incident Commander), fire fighters on the box alarm, the department safety officer, and the investigation team from the fire department involved in the incident.

Representatives from the personal protective equipment manufacturer, the National Institute of Standards and Technology (NIST) who evaluated the victims' personal protective equipment and will be developing the fire growth data for the department, the metropolitan police, and the owner of the townhouse were also interviewed. Copies of photographs, training records, Standard Operating Procedures (SOPs), the reports completed by fire department investigators, the autopsy reports, and the floor plan of the townhouse were obtained. A site visit was conducted and photographs of the fire scene were taken.

The fire department involved in this incident is comprised of 1,764 total employees, of whom 1,182 are uniformed fire fighters. The department serves a population of approximately 1 million in a geographic area of 69 square miles. The fire department requires all new fire fighters to complete fire fighter level I and fire fighter level II requirements, Emergency Medical Technician courses, hazmat, driver and vehicle operations, first aid, search and rescue, live fire training, and cardiopulmonary resuscitation (CPR). Fire fighters are then assigned to a department where they are placed on probation for 1 year. Each fire fighter is also certified as an Emergency Medical Technician (EMT). Refresher training courses are continued throughout the year. The victims' training records were reviewed and appeared to be adequate. Victim #1 had 6½ years of experience as a fire fighter and EMT, while Victim #2 had 3½ years of experience as a fire fighter and EMT.

Additional companies responded to this incident; however, only those directly involved are included in this report.

INVESTIGATION

On May 30, 1999, at 0017 hours, Central Dispatch received a call of a house fire. Dispatch toned out a box alarm which consisted of the following:

- 1st due Engine 26 (Lieutenant and 3 fire fighters [including Victim #1])
- 2nd due Engine 17 (Captain and 3 fire fighters)
- 3rd due Engine 10 (Lieutenant and 3 fire fighters [including Victim #2])
- 4th due Engine 12 (Lieutenant and 3 fire fighters)
- 1st due Truck 15 (Captain and 3 fire fighters)
- 2nd due Truck 4 (Lieutenant and 3 fire fighters)
- Rescue 1 (Lieutenant and 4 fire fighters)
- Battalion Chief 1 (the Incident Commander) (BC-1)

The working fire alarm was dispatched at 0023 hours and consisted of the following:

- Engine 14 (Sergeant and 3 fire fighters)
- Chief 2

- Air 2 (1 fire fighter)
- Fire Investigation Unit (Car 43) (fire investigator)
- Alcohol Tobacco and Firearms (ATF) (Car 83)
- Medic 17 (2 paramedics)
- Department Safety Officer

The Hazmat Unit was also dispatched at the same time as the working fire alarm.

At 0029 hours, a task force alarm was toned with the following response:

- Engine 6 (Lieutenant and 3 fire fighters)
- Engine 4 (Lieutenant and 3 fire fighters)
- Truck 7 (Lieutenant and 3 fire fighters)
- Battalion Chief 4

As companies responded to the call of a house fire, dispatch made a second report that the fire was in the basement. During the investigation, it became clear that all companies did not receive the second report of a basement fire. Engine 26 was first to arrive on the scene at 0023 hours and reported smoke showing from the front of the building. Being the first-due engine, they positioned the engine in the small parking area in front of the row of townhouses (see Diagram 1). Engine 10 arrived behind Engine 26 as the third-due engine company and stretched a 400-foot, 1½-inch line to the front entrance (see Photo 1). Engine 17 was the second-due engine company, also arriving at 0023 hours. Upon arrival, Engine 17 stretched a 350-foot, 1½ -inch line around the adjacent units (see Diagram 1) to the rear of the burning townhouse. Arriving at 0024 hours was Engine 12, as the fourth-due engine company, which by department Standard Operating Procedures (SOPs), required them to back up Engine 17 in the rear. Instead of backing up Engine 17, the crew of Engine 12 went to the front. The IC (BC-1) was en route to the scene, and from the report he received from Engine 26, he requested a working-fire dispatch. The working-fire alarm dispatched Engine 14, Battalion Chief 2 (BC-2), Air 2, Fire Investigation Unit (Car 43), the Alcohol Tobacco and Firearms (ATF) unit (Car 83), Medic 17, and the department's Safety Officer. The Hazmat Unit was also dispatched at the same time. The IC ordered BC-2 to take command of the rear when he arrived on the scene.

The front door of the townhouse was open and emitting thick, black smoke. With a charged line, a fire fighter from Engine 26 (Victim #1) approached the front door, as his layout man and officer donned their SCBAs. Preparing to enter, Victim #1 experienced a problem with his SCBA facepiece. He returned to the engine and switched facepieces with his Wagon Driver. After switching facepieces, he told his officer at the front door that everything was working properly and he was taking in a line. With a charged line, he entered through the front door. Shortly after, the layout man entered, followed the line, and met the fire fighter (Victim #1). The officer of Engine 26 entered last and proceeded into the structure to locate his crew. With a charged line, a fire fighter (Victim #2) and the Lieutenant from Engine 10 entered behind the officer from Engine 26 to provide back up. The layout man from Engine 10 was ordered by his Lieutenant to stay at the front door and feed the line inside.

Truck 15 arrived on scene at 0024 hours as the first-due truck company, and started ventilation in the front according to department SOP requirements. The officer and a fire fighter on Truck 15 threw a ladder to the roof and the officer began to ventilate the large front window at ground level. Security bars were blocking the window, so a fire fighter from Truck 15 entered the structure, approximately 10 feet into the kitchen area, to vent the window from the interior. The fire fighter then exited the structure (see Floor Plan A-1). Next, the officer from Truck 15 climbed the ladder and stopped at a window on the second floor to knock it out. After knocking out the window, he returned to the ground as the driver and Tillerman from Truck 15 climbed the ladder to the roof. The two of them cut approximately three vent holes in the roof and stated that thick, black smoke was emitting from the holes. Truck 4 arrived at 0025 hours as the second-due truck company and began ventilation in the rear of the structure. *[NOTE: Truck 4 was responding for Truck 13, which was out of service at the time of this incident. Truck 13 was housed in the same station as Engine 10 and would have arrived on the scene at the same time as Engine 10 (approximately 2 minutes earlier) if it had been in service.]* On arrival, a fire fighter and the officer from Truck 4 began forcible entry to the rear basement sliding-glass door (which was protected by an iron security gate (see photo 2)) as the driver and the Tillerman from Truck 4 threw ladders to the windows above the door (see Floor Plan A-2). The fire fighters stated that they saw small spot fires all over the basement floor. The driver and the Tillerman tried to knock out the windows on the second floor, but felt they were unsuccessful because they could not feel the ladders breaking the glass. They also tried to break the sliding-glass door on the first floor with the ladder, but could not. *[NOTE: The windows on the second floor were left open by the homeowner, which is why the fire fighters could not feel the glass break. The sliding-glass door on the first floor was a two-panel sliding-glass door, which fire fighters could not break with the ladder they were using. The sliding-glass door on the first floor had no security gate over it.]* The driver and Tillerman from Truck 4 left the ladder at the window on the second floor and returned to the truck to get a second ladder to go to the roof.

Engine 17 was now positioned at the rear sliding-glass door as Truck 4 prepared entry (basement level). Using a gas-powered saw and a sledge hammer, the officer and fire fighter from Truck 4 removed the iron security gate and broke open the glass door at 0026 hours (see Photo 2). Members of Truck 4 and Engine 17 stated that when the sliding-glass door was opened, air began to be sucked inside by the fire. They also saw small fires on the floor and stated that when the door was opened the fires grew larger. The Lieutenant from Engine 17 reported to the IC that they had fire on the first floor and requested permission to hit the fire. *[NOTE: Engine 17 was unaware that they were at the basement level due to the route they took to get to the rear. As they proceeded to the rear, they noticed the row houses they went between were only two stories, which caused confusion (see Diagram 1).]* The IC denied their request in fear of opposing hose lines. He then radioed the officer from Engine 26 to locate their position. He received no response from them. The IC knew that the crews from Engine 26 and Engine 10 had entered through the front door on the first floor.

Rescue 1 arrived on the scene at approximately the same time that Truck 4 made entry. They were required to complete search and rescue operations. Two fire fighters from Rescue 1 and a fire fighter from Truck 4 entered the basement to search the interior for any civilians. Shortly after they entered, the Lieutenant from Engine 17 ordered them out as conditions began to deteriorate. One of the fire fighters who exited stated that they were able to follow a small path (limited fire) to the exterior before the entire basement erupted into flames.

The driver and Tillerman from Truck 4, who returned to the truck to retrieve a second ladder, saw that the basement was fully engulfed with fire. They decided to pull a line from Engine 12 to provide back up for Engine 17. Engine 12 was supplying Engine 17 and had positioned their engine towards the rear of the structure, but Engine 12's crew proceeded to the front of the structure (see Diagram 1). The officer and a fire fighter from Engine 12 entered the front of the structure advancing approximately 2 to 3 feet, where they remained throughout the attack. The Lieutenant from Engine 17 requested to hit the

fire a second time and was denied. The IC denied their request because he still had not received a response from the officer of Engine 26. The IC radioed the officer of Engine 26 a second time and received no response.

At this point Engine 26 and Engine 10 were inside the structure searching for the basement door. Department SOPs required them to locate the basement door and close it or hold off at the stairs with a fog spray. The fire fighter on Engine 26, who entered the structure to back up the Nozzleman (Victim #1) stated that it was extremely hot, but tolerable, when he met up with Victim #1. He stated that the floor was solid and as they proceeded further into the structure, and visibility was improving. He recalled seeing the sliding-glass door to the rear of the first floor, a table, and a sofa on his right side. This would position Victim #1 and the fire fighter in the living room, in front of the basement-stairs door (see Floor Plan A-1). He also stated there were no signs of fire and the heat remained constant. He could not recall his officer joining the two fire fighters, but did recall hearing a radio transmission. *[NOTE: Only officers carry radios and he did not know whose radio he heard.]* It was determined that Engine 10 was inside backing them up at this time, however, the two fire fighters from Engine 26 were unaware of any other fire fighters inside.

After hearing the radio transmission, the fire fighter from Engine 26, backing up Victim #1, looked over his left shoulder and saw fire appear, filling up what looked to be a doorway. He stated the fire came out of the doorway, then disappeared, and everything went black. At that point he felt an intense blast of heat. He dropped the line and immediately started squirming around in his turnouts, in an attempt to release the heat. He asked Victim #1 where the hose line was and related to him that something was wrong and they had to get out. Victim #1 responded by saying that he did not know where the hose line was. The fire fighter stated that Victim #1 sounded as if he was in a crouched position waiting to be rescued. He then heard a loud scream from his left side, which lasted approximately 15 seconds. The scream was clear and not muffled by an SCBA. He stated that the scream was getting closer when he heard a loud thump, as if someone dropped to the floor, and then complete silence. He then crawled forward and found the nozzle of a hose line. *[NOTE: Victim #2 was found not wearing his SCBA facepiece. It is believed the scream was from Victim #2.]*

The Lieutenant on Engine 10 recalled that as they backed up Engine 26, he turned back towards the front door and could see some light from the front doorway (entrance). He also stated that it was very hot inside the structure. As he turned back around, he felt an intense blast of heat and was knocked backward by a frantic fire fighter attempting to exit. The lieutenant then exited through the front door. When the heat hit the fire fighters, the Lieutenant thought that he was in the hallway, next to the basement door (see Floor Plan A-1). The officer of Engine 26 stated that as he made his way toward the rear of the structure to join his crew, he also encountered an intense blast of heat. Feeling that he was being burned, he quickly turned, and exited through the front door. The layout man from Engine 10 started pulling out the hose line from Engine 10, in an attempt to assist Victim #2 in his exit. As he pulled the hose line out, he noticed there was no one on the end, which meant Victim #1, Victim #2, and the fire fighter from Engine 26 remained inside.

As the officers from Engine 26 and Engine 10 exited, the IC was walking up to the structure to get a better position. The IC was unaware of any problems until he got close enough to see the fire fighters exiting. He immediately ran to the front and saw the officer from Engine 26, who related to him that Victim #1 was still inside. The IC then saw the Lieutenant from Engine 10 and ordered him to go back inside with his crew and search for Victim #1. The IC later recalled that the Lieutenant from Engine 10 appeared to be dazed and did not relate to him that anyone else was missing. The IC only became aware that Victim #1 was missing at this time.

The fire fighter from Engine 26, who was still inside, stated that as he grabbed the nozzle he rolled on

his back and opened it on the ceiling in a straight stream circular pattern. He felt the room was going to flash and wanted to cool it down. As he applied water, he recalled seeing fire on the ceiling. He stated that the water reduced the heat, but it was still very hot. He opened the line a second time on the ceiling and did not see any fire. He then followed the line, exiting the structure. He did not hear any other fire fighters inside or any Personal Alert Safety Systems (PASS) alarming at that time. He stated that he was inside for approximately 1½ minutes from the time the blast of heat hit them until his exit. He exited the structure at approximately 0031 hours. He asked if Victim #1 had made it out and was told that he had not. He communicated to the IC that he thought Victim #1 was still inside, straight back through the hall, and to the right by a sofa (see Floor Plan A-1).

The IC received an additional request from Engine 17 in the rear, this time stating they were at the basement level and had heavy fire inside the basement. Engine 17 requested permission to hit the fire and the IC responded by telling them that they had a fire fighter down inside, on the first floor, and to hit the fire with a straight stream. Engine 17 opened the straight stream on the fire in the basement and quickly knocked it down. At approximately 0032 hours, the Lieutenant from Engine 10 reentered the townhouse to begin his search.

Joining the Lieutenant was the Lieutenant and a fire fighter from Rescue 1. They entered through the front door to begin their search, stating the heat was tolerable, and visibility was improving. As they got inside the structure they could hear a PASS alarm going off. They immediately followed the shrill alarm to locate a downed fire fighter. The fire fighter was lying under a table, unconscious, and with his SCBA facepiece off. His SCBA was equipped with an integrated PASS alarm, which was automatically activated when the victim turned on his SCBA. After locating the downed fire fighter, they called for assistance to remove him. The IC ordered the Hazmat crew to enter and assist removing the downed fire fighter. Engine 14's crew was already on their way inside to provide assistance. Additional fire fighters from Engine 6 and Engine 4 also entered the townhouse and helped remove the victim to the front lawn, at approximately 0045 hours. They immediately started cardiopulmonary resuscitation (CPR) and provided medical treatment to the victim's burns. The victim, who was later identified as Victim #2, was severely burned and the IC could not determine if it was the fire fighter they were searching for, or another fire fighter. A fire fighter standing nearby related to the IC that he could tell by the size of the victim that it was not Victim #1. The IC continued the search efforts, and at approximately 0049 hours, Victim #1 was found and removed. He was found slumped over the couch face down (see Floor Plan A-1). He was found equipped with a PASS device (manually operated) attached to his turnout gear. The PASS device was not activated and was found in the off position. *[NOTE: The PASS device was later inspected and was determined to be working properly.]* Fire fighters removed the victim to the front lawn of the structure where they located a pulse and immediately provided medical treatment. All three fire fighters, along with the Lieutenant from Engine 26, were transported to a nearby hospital.

Victim #1 was treated for his burns and was admitted to the burn unit. He was pronounced dead the following day, May 31, 1999, at 1450 hours. Victim #2 was pronounced dead on arrival to the hospital on May 30, 1999, at 0108 hours. The injured fire fighter from Engine 26 received first-, second-, and third-degree burns to over 60 percent of his body. He was admitted to the burn unit where he was treated for his burns. He has been released from the burn unit and is currently undergoing rehabilitation. The Lieutenant from Engine 26 received treatment for burns to his hands and head area and was released the following day. He is currently back to his normal duties.

CAUSE OF DEATH

According to the Medical Examiner, Victim #1 died due to thermal injuries involving 60% of total body

surface area and airways. Victim #2 died due to thermal injuries involving 90% of total body surface area and airways.

RECOMMENDATIONS AND DISCUSSION

Recommendation #1: Fire departments should ensure that the department's Standard Operating Procedures (SOPs) are followed and refresher training is provided.¹

Discussion: *"It is imperative that companies perform their duties as described in the Standard Operating Procedures (SOPs) unless directed by, or with notification to, and approval of, the Incident Commander."*¹ According to department SOPs, the following procedures should take place:

- ***Engines responding should take their due positions.***

Department SOPs state that the first-due engine company will layout and take a position in the front of the building. The second-due engine company should layout and take a rear position. The third-due engine company should back up the first-due engine company in the front and the fourth-due engine company should back up the second-due engine company in the rear. Engine 12 was the fourth-due engine company, and according to department SOPs was required to back up Engine 17 in the rear. On arrival, Engine 12 proceeded to the front of the structure and took position, leaving Engine 17 in the rear with no back up. Throughout operations, Truck 4 backed up Engine 17 in the rear.

- ***Officers should keep in contact, physically or verbally, with their crews at all times during interior fire fighting.***

Department SOPs state that the officer in charge (OIC) should always be in contact with his crew by voice, touch, or sight.

- ***Ensure that when a fire fighter is not accounted for, it is reported to the IC immediately and a roll-call is ordered.***

Department SOPs state that a mechanism to quickly account for personnel must be available to the IC at any point during the incident. The officer from Engine 10 exited the structure without Victim #2. At that point, the victim's position was not accounted for, and it was not reported to the IC. When the IC becomes aware a fire fighter is not accounted for, a roll-call should then be ordered. When the roll-call is taken, any fire fighters not accounted for should be immediately reported to the IC. In this incident, the IC only became aware that Victim #1 was missing at the time search and rescue efforts took place.

- ***Provide adequate personnel to operate according to department SOPs.***

Department SOPs state that Sector Leaders can be assigned to sectors for accountability, to monitor progress, redirect activities within the sector, coordinate activities, monitor safety, request additional resources as needed, communicate with command or other Sector Leaders, and reallocate resources within the sector. The Sector Leader would be a company officer or a Battalion Chief and would be designated as Sector Leader by the IC. In the early stages of this incident, an adequate number of personnel was not on the scene to perform

effectively and in accordance with the department SOPs. The officer on Truck 4 was performing tasks with one of his fire fighters while the officer on Engine 17 was on the initial attack line in the rear. All ventilation efforts in the rear were not completed when conditions rapidly changed (the sliding-glass door on the first floor was not vented until conditions deteriorated). Truck 4 eventually backed up Engine 17, because Engine 12 had proceeded to the front of the structure, which also delayed ventilation. With all officers in the rear performing operational tasks, no monitoring took place. This hindered the opportunity to complete proper ventilation, to provide timely reports to the IC, and allowed a breakdown in communication. To be compliant with department SOPs, additional personnel would have been needed to free up a company officer to serve as a Sector Leader.

- ***Ensure that first arriving companies give the required size-up report to communications on the fireground channel.***

According to department SOPs, the first arriving units in the front and rear of the building, or the incident site, should give a size-up report to communications on the fire channel 1 and then switch to the fireground channel for subsequent fireground communications. The fireground channel is an informal radio channel to report what you see, what you don't see, and what you think. It is to be used for fireground communications between units, between units and Sector leaders, and between Sector Leaders and the Incident Commander. All responding units will monitor the fireground channel to hear reports between units on scene and the responding Battalion Chief, and will be aware of the fireground situation before arrival. Also, responding units should monitor the fireground channel since they may be contacted by the Battalion Chief or Sector Leader for assignment prior to arrival on the fireground. In this incident, Engine 26 gave a size-up report to communications when they arrived. A size-up of the rear conditions was never reported by the first arriving unit in the rear.

Fire departments should also ensure that, whenever possible, a size-up is made from the inside. At the initial stage of a fire the inside size-up is more accurate and useful than the size-up made from outside the building. The officers inside the structure are closer to the fire and obviously can see more than someone outside the building at the command post.²

Recommendation #2: Fire departments should consider providing the Incident Commander with a Command Aide.³⁻⁵

Discussion: Aides are personnel assigned to assist the Incident Commander. During large operations, Sector Leaders also may have aides to assist them. They do this by managing information and communications. They can keep track of assignments, locations, and the progress of companies, assist with tactical worksheets, or access reference materials and pre-fire plans. Another important function they may perform is to provide reconnaissance and operational details for the IC (his eyes and ears). Some jurisdictions assign full-time aides to command officers to perform routine administration functions and to act as drivers in addition to their fireground role. Departments should consider the aide to be an individual that has the experience and authority to conduct the required tasks.

Battalion Fire Chiefs are required to respond quickly to emergency incidents. In their response, they have to be fully aware of heavy traffic conditions, construction detours, traffic signals, and other conditions. Also, they must monitor and comprehend which companies are responding, fireground

activity, fire conditions, and additional information from dispatch. If possible, they will also monitor all incoming information from dispatch and the fireground and make important decisions. Aides could assist the Battalion Fire Chief in processing information without distraction and complete the necessary tasks en route to the scene. In this incident, an aide could have been directed to go to the rear of the structure and determine what floor level the fire fighters in the rear were on. The aide could have also driven the IC to the incident scene, freeing up the IC to better comprehend all information and make important decisions prior to arrival.

Recommendation #3: Fire departments should ensure that fire fighters from the ventilation crew and the attack crew coordinate their efforts.^{2, 3}

Discussion: The importance of ventilation when attacking basement fires cannot be overemphasized. Fire can quickly spread upward into the structure causing potential problems such as a flashover, backdraft, or weakening of the structure. Ventilation timing is extremely important and must be carefully coordinated with both fire attack and ventilation crews. Ideally, it should occur just ahead of interior crews advancing their hose lines. Properly ventilating the heat and smoke from buildings can reduce the possibilities of potentially hazardous situations fire fighters can be faced with. The fire fighters performing ventilation tasks should be in communication with the fire fighters attacking the fire or entering the structure to coordinate their efforts. In this incident, fire fighters from Engine 26 entered the structure as fire fighters from Truck 15 began ventilation efforts in the front of the structure. Truck 4 was delayed in its ventilation efforts because it arrived late as a replacement for Truck 13 (which was out of service). The crew from Engine 10 also entered behind Engine 26 as back up. At that point, ventilation had not been completed. Fire fighters on the attack lines experienced considerable heat and heavy smoke conditions. They were forced to crawl inside the structure and stated that the heat remained consistent as they proceeded into the structure. When the rear sliding-glass door (basement) was opened by Truck 4, the small fires in the basement began to grow rapidly.

Recommendation #4: Fire departments should ensure that when a piece of equipment is taken out of service, appropriate backup equipment is identified and readily available.⁵

Discussion: Equipment on the fireground is very important to any fireground operation. It should be kept clean, in safe operating condition, and repaired when necessary. When any piece of equipment is taken out of service for repair, a new or backup piece of equipment should be immediately placed in service. In this incident, the truck company (Truck 13) that would have responded with Engine 10 was out of service. A backup truck was not placed in service to replace Truck 13 causing Truck 4 to be dispatched from a different location. Truck 4 arrived on the scene approximately 2 minutes after Engine 10 (Truck 13 would have arrived on scene approximately the same time as Engine 10), which delayed ventilation procedures.

Recommendation #5: Fire departments should ensure that personnel equipped with a radio position the radio to receive and respond to radio transmissions.³

Discussion: The fireground communications process combines electronic communication equipment, a set of Standard Operating Procedures, and the fire personnel who will use the equipment. To be

effective, the communications network must integrate the equipment and procedures with the dynamic situation at the incident site, especially in terms of the human factors affecting its use. The ease of use and operation may well determine how consistently fire fighters monitor and report over the radio while fighting fires. In this incident, radio calls were made several times by the IC to an engine company, and the IC never received a response. Dispatch tapes recorded the transmission made by the IC to the engine company, but it remains unclear why the engine company never responded. NIOSH investigators have also reviewed a photograph taken approximately the same time the interior crews had exited the structure. An officer in the photograph had his radio positioned in his front bottom pocket (approximately waist level) of his turnout coat. The officer was not identified. Fire departments should review both operating procedures and human factors issues to determine the ease of use of radio equipment on the fireground to ensure that fire fighters consistently monitor radio transmissions from the IC and respond to radio calls.

Recommendation #6: Fire departments should consider using a radio communication system that is equipped with an emergency signal button, is reliable, and does not produce interference.⁶

Discussion: Radio communication is one of the most important functions on the fireground. When situations on the fireground arise, radio transmissions need to be made in a timely and understandable fashion.

- ***Departments should operate on a radio frequency that does not "bleedover" or cause interference.***

Radios need to be reliable, in good working condition, and fully charged and ready to use. They should not produce interference or "bleedover." Fire departments should also take into consideration the frequency on which the radio communications system will operate. The National Fire Protection Association (NFPA) recommends that frequencies should be 15 kHz apart in the VHF high band. The separation in frequencies is to avoid possible interference. The frequencies used by the department involved in the incident are 15 kHz apart. However, in the past, this department has experienced problems with interference or "bleedover" between Channels 1 and 4. Interference or "bleedover" between Channel 1 and Channel 4 has been noted because the frequencies are close to one another. The frequency for Channel 1 (Fire Channel) is 154.190 KHz and the frequency for Channel 4 (Fireground Channel) is 154.205 KHz. Although the frequencies meet the NFPA recommended standard of separation, there still remains a problem with "bleedover" or interference. For this reason, departments should consider changing the fireground channels or adjust the frequencies to reduce further "bleedover" or interference. The radio of the officer from Engine 26 was tested after the fire and appeared to be working properly. The officer could not recall receiving any radio transmissions from the IC; however, the dispatch tapes recorded a radio transmission from the IC to the officer of Engine 26. There is a possibility that the officer did not receive the call because of "bleedover" or interference.

- ***Departments should consider using portable radios equipped with an emergency signal button.***

Fire fighters are always encountering potentially hazardous situations and should be prepared with the proper equipment to assist them in an emergency. Departments should consider using portable radios equipped with an emergency signal button. When fire fighters become trapped or encounter an emergency situation where assistance is needed,

they could push the emergency signal button on their portable radio. When the emergency signal button is pushed, it would transmit an emergency alert signal to dispatch, the IC, or possibly all radios. This signal would signify that a fire fighter needs assistance and would alert all fireground personnel that an emergency call is going to be transmitted.

Recommendation #7 Fire departments should ensure that all companies responding are aware of any follow-up reports from dispatch.³

Discussion: From the very beginning of fireground operations, the IC must use communications to initiate and evaluate fireground actions. Upon arriving, he needs to advise all operating companies of the basic details of the attack plan and provide an initial status report. This transmission should explain the conditions he can see from the command post, and should be directed to everyone on scene, arriving at the scene, or en route to the scene. The initial report should provide a standard description of the following items: building size, building height, occupancy, fire/smoke conditions, confirmation of any additional reports, designation of command, and action being taken. If a Sector Leader is assigned, the IC can communicate directly to the Sector Leader to receive direct transmissions. Additional reports initiated by dispatch should be noted and all companies, on the scene or responding, should be aware of the report. In this incident, the initial dispatch report stated that it was a house fire. As companies responded, dispatch made a second report stating the fire was in the basement. Some of the companies acknowledged the report, others did not. Fire departments should develop and implement a SOP to ensure all radio transmissions are received by all responding units.

Recommendation #8: Fire departments should ensure that a Rapid Intervention Team is established and in position immediately upon arrival.⁵

Discussion: A Rapid Intervention Team (RIT) should respond to every major fire. The team should report to the officer in command and remain at the command post until an intervention is required to rescue a fire fighter(s). The RIT should have all tools necessary to complete the job, e.g., a search rope, first aid kit, and a resuscitator to use if a fire fighter becomes injured. The RIT will be ordered by the IC to complete any emergency searches or rescues. It will provide the companies with the opportunity to regroup and take a roll call, instead of performing rescue operations. When the RIT enters to search and rescue, each team member will have a SCBA with a full cylinder and will be physically prepared. In this incident, the officer on Engine 10 and fire fighters from additional companies, who had already been involved in fireground operations, entered the structure to search for Victim #1. If a roll call had been ordered during search operations, the officer of Engine 10 would have been inside the structure and would not have been able to report to the IC that one of his crew members was unaccounted for. If a RIT had been in place, accountability calls could have been conducted because fireground officers would not have been directed to rescue operations.

Recommendation #9: Fire departments should ensure that any hose line taken into the structure remains inside until all crews have exited.⁷

Discussion: Fire fighters who enter smoke-filled enclosures should be equipped with a safety line or hose line in the event that a fire fighter becomes disoriented or trapped. Many fire fighters who die from

smoke inhalation, a flashover, or are caught or trapped by fire, actually become disoriented first. They are lost in smoke, their SCBA run out of air, or they cannot find their way to exit through the smoke. Although fire or smoke kills them, the primary contributing factor is disorientation. By using a life line or hose line, the fire fighter is able to determine the direction of exit by the couplings that connect two hose lines together. The male coupling signifies the exit direction. When trying to exit, fire fighters are trained to find the line and follow it out, which is what the injured fire fighter from Engine 26 did. The line should remain inside as a guide for fire fighters to follow.

Recommendation #10: Fire departments should consider providing all fire fighters with a Personal Alert Safety System (PASS) integrated into their Self-Contained Breathing Apparatus.

Discussion: PASS devices, which are electronic devices worn by the fire fighter, emit a loud and distinctive alarm if the fire fighter becomes motionless for more than 30 seconds. Fire fighters entering hazardous areas should be equipped with a PASS devices. There are several types of PASS devices available. One device that could be used is the PASS that is integrated into the SCBA. PASS devices integrated into the SCBA will be activated when the SCBA air cylinder is turned on. Manual PASS devices are also used throughout the fire service. These devices require the fire fighter to manually turn on the device each time they use it. In this incident, Victim #2 was equipped with a PASS device integrated into his SCBA. Victim #1 was equipped with a manual device. When search efforts took place, the fire fighters searching the structure were only aware that Victim #1 was missing. When they entered the structure, they recalled hearing a PASS device sounding. The fire fighters followed the alarm and located a fire fighter, later to be identified as Victim #2. Victim #1 was located inside the structure approximately 4 minutes later. Victim #1 was found to be equipped with a manual PASS device attached to his turnouts. However, his PASS device was never turned on.

Recommendation #11: Fire departments should develop and implement a preventive maintenance program to ensure that all SCBA's are adequately maintained.⁸

Discussion. Fire departments should establish service and maintenance procedures and rigidly enforce them to provide respirators that are dependable and are constantly evaluated, tested, and maintained. Equally important is record keeping, a critical element of any respirator maintenance program. During this incident, Victim #1 stated that as he prepared to enter the structure, he experienced a problem with his SCBA facepiece. He returned to the engine and replaced his facepiece with the Wagon driver's facepiece. NIOSH completed an evaluation of the fire department's SCBA program on July 21, 1999 and issued a report to the department (see Attachment 1).

REFERENCES

1. District of Columbia Fire Department. *Written Standard Operating Procedures*.
2. Dunn V [1992]. *Safety and Survival on the Fireground*. Saddle Brook, NJ: Fire Engineering Books & Videos.
3. Brunacini, Alan V [1985]. *Fire Command*. Quincy, MA: National Fire Protection Association.

4. NFPA 1201: Standard for Developing Fire Protection Services for the Public 1994 ed. Quincy, MA: National Fire Protection Association.
5. NFPA 1500: Standard on Fire Department Occupational Safety and Health Program 1997 ed. Quincy, MA: National Fire Protection Association.
6. NFPA 297: Guide on Principles and Practices for communication systems 1995 ed. Quincy, MA: National Fire Protection Association.
7. International Fire Service Training Association. March 1998. Essentials of Fire Fighting, 4th ed. Fire Protection Publications.
8. National Institute for Occupational Safety and Health (NIOSH). August 1999. District of Columbia SCBA Maintenance Program Evaluation Report, Respirator Branch, Division of Respiratory Disease Studies, NIOSH, Morgantown, WV.

INVESTIGATOR INFORMATION

This incident was investigated by: Frank Washenitz, Safety and Occupational Health Specialist; Rich Braddee, Project Officer/Team Leader; Ted Pettit, Senior Investigator; and Eric Schmidt, Safety Engineer all from the Surveillance and Field Investigations Branch, Division of Safety Research, NIOSH.

The SCBA maintenance program was evaluated by: Tim Merinar, Engineer, and Tom McDowell, Physical Scientist, Respirator Branch, Division of Respiratory Disease Studies, NIOSH.

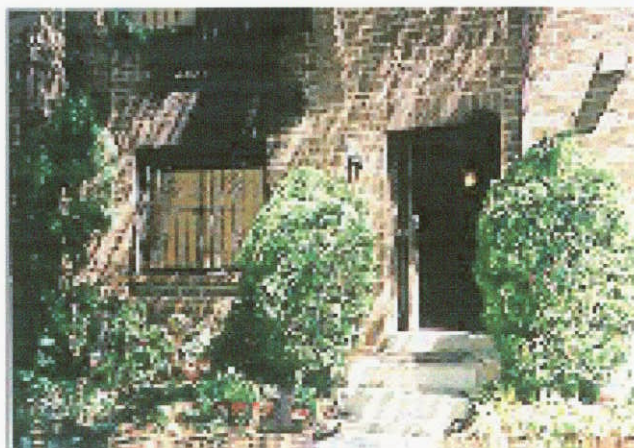
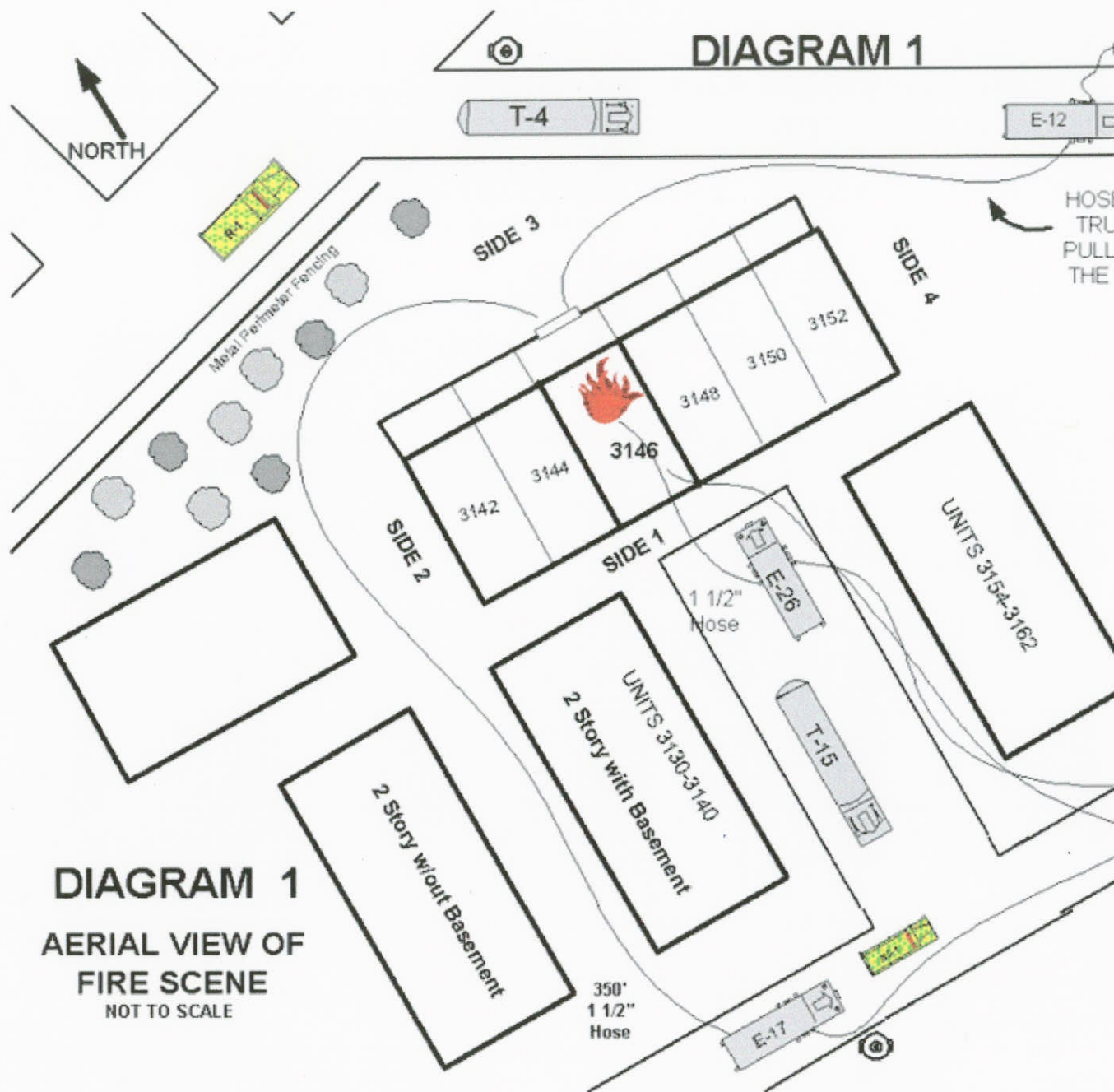
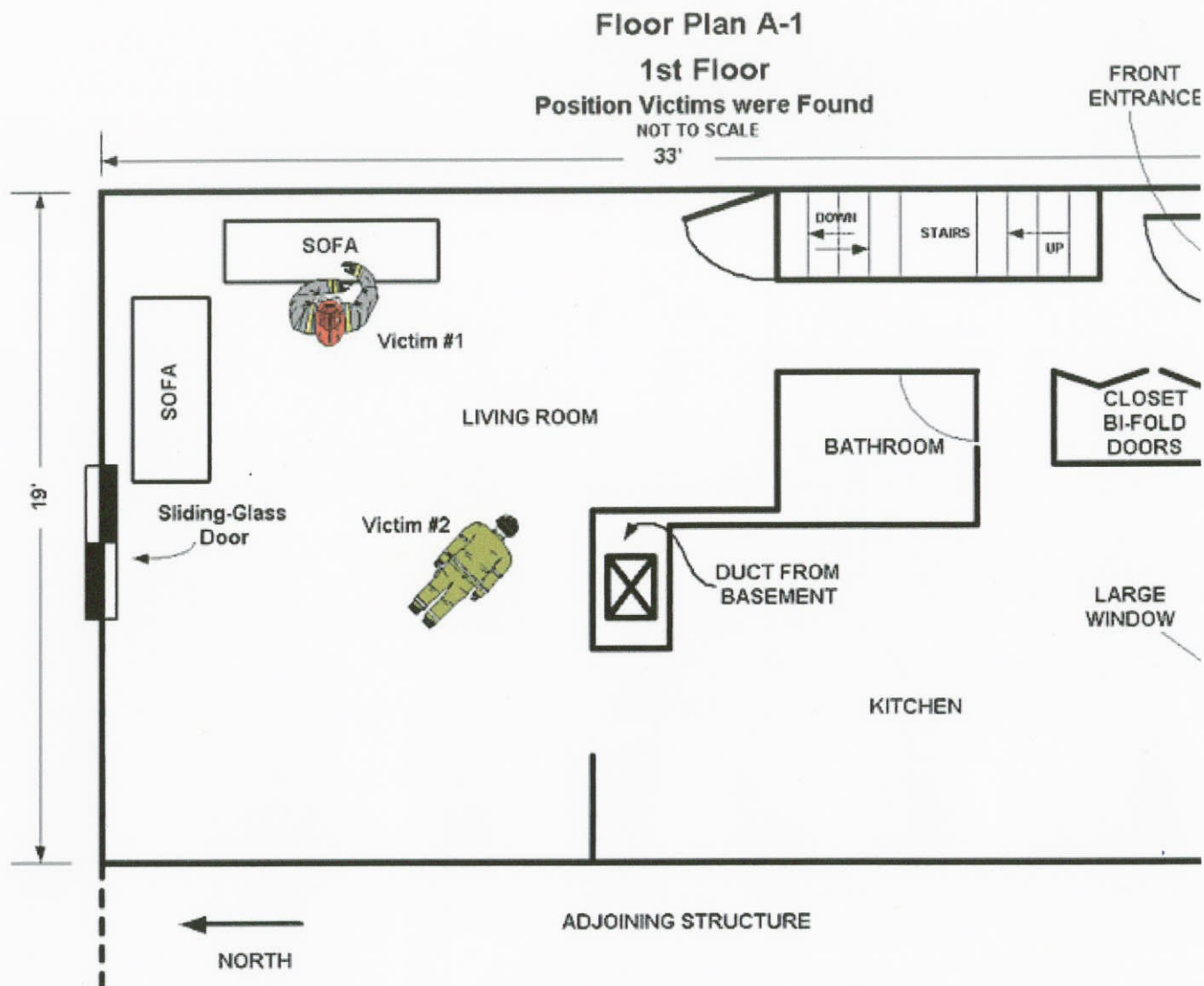


Photo 1: This photo depicts the front (side 1) entrance of the townhouse involved in the incident.



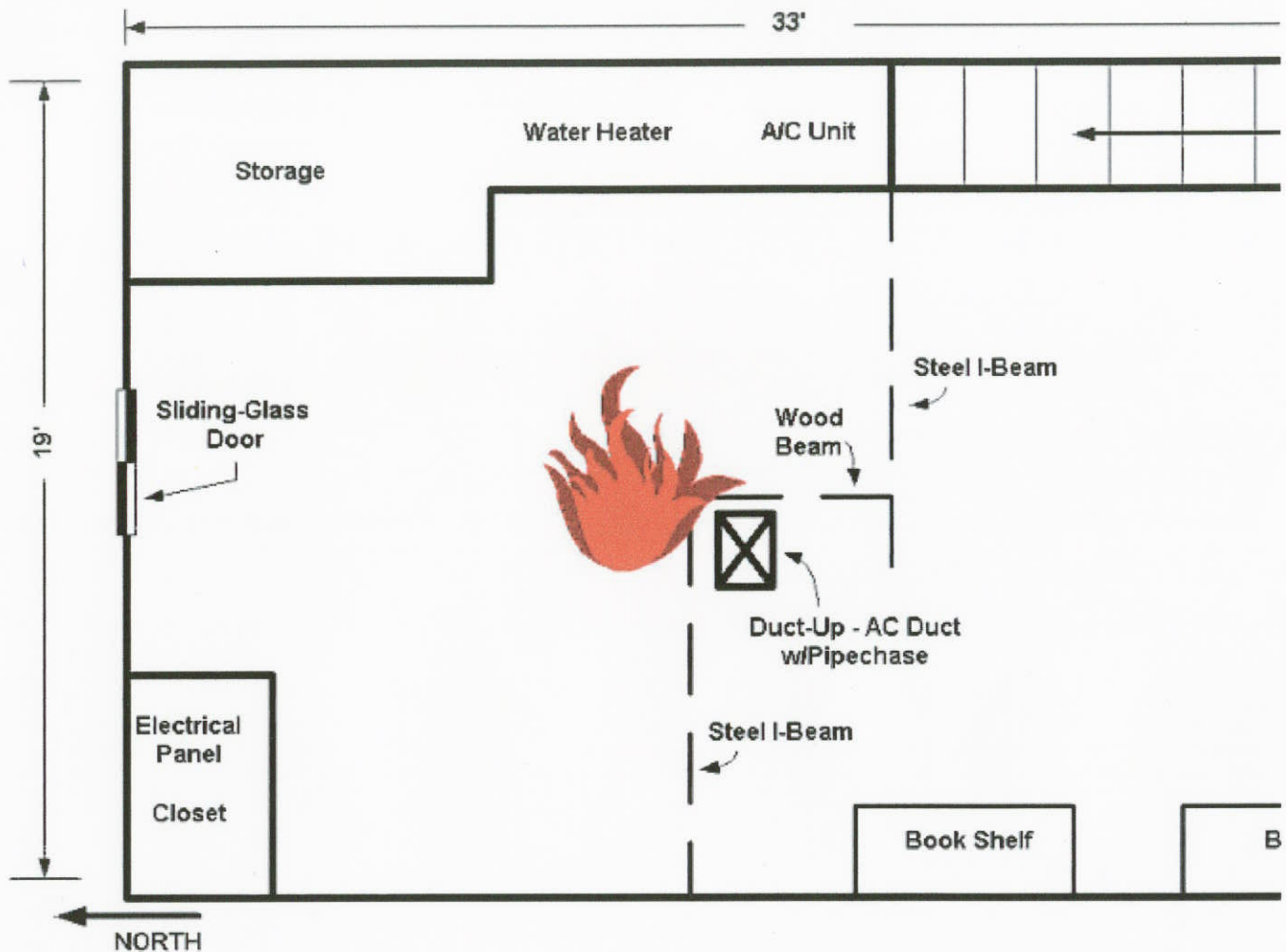
Photo 2: *This photo depicts the rear (side 3) sliding-glass door leading to the basement*





Floor Plan A-2**Basement**

NOT TO SCALE

**Attachment 1.**

PHONE: (304) 285-5907

FAX: (304) 285-6047

Captain Timothy H. Gerhart
Safety Officer
District of Columbia
Fire & Emergency Medical Services
Fire & EMS Safety Office
2531 Sherman Ave. N.W.
Washington, DC 20001

Dear Captain Gerhart:

During our recent visit to the District of Columbia Fire and Emergency Medical Services Safety Office on July 21, 1999, Thomas McDowell and I had the opportunity to evaluate your fire department self-contained breathing apparatus (SCBA) maintenance program. One of the objectives of our visit was to evaluate your SCBA maintenance program and to make recommendations for improvement. This evaluation was conducted on July 21, 1999, and consisted of visiting the SCBA maintenance area, reviewing maintenance records, evaluating the compressed-air and oxygen cylinder refilling stations as well as discussions with available fire department personnel involved in the SCBA maintenance program.

Your current SCBA maintenance program was evaluated against the respirator and SCBA maintenance requirements listed in the following recognized national standards:

Title 29, Code of Federal Regulations (CFR) Part 1910.134 known as The OSHA Respirator Standard.

National Fire Protection Association (NFPA) 1404 Standard for a Fire Department Self-Contained Breathing Apparatus Program, 1996 Edition.

National Fire Protection Association (NFPA) 1500 Fire Department Occupational Safety and Health Program, 1997 Edition

These standards are recognized national standards and as such, specify the minimum benchmark requirements that all good respirator programs should strive to meet or exceed. Compliance with these standards is considered to be essential to maintain your SCBA in a condition meeting the certification requirements of the National Institute for Occupational Safety and Health (NIOSH) found in *Title 42, Code of Regulation, Part 84, Subpart H*, as well as the *National Fire Protection NFPA 1981 Standard on Open-Circuit Self-Contained Breathing Apparatus for the Fire Service, 1997 Edition*. Failure to maintain your SCBA in an approved condition voids the NIOSH approval until such time as each affected SCBA can be inspected, serviced, and returned to an approved condition.

The following areas were identified within the District of Columbia Fire & Emergency Medical Services SCBA maintenance program as areas where improvement is needed in order to comply with the referenced national standards:

1) The SCBA maintenance program should be under the direct control of one designated individual who is a District of Columbia Fire and Emergency Medical Services employee and who has no other fire fighting or administrative responsibility. In general, this individual's area of responsibility could be tailored to meet each departments needs, but should include supervision of the SCBA preventive maintenance program, record keeping, and auditing.

Title 29, Code of Federal Regulations (CFR) Part 1910.134 (the OSHA Respirator Standard) at 1910.134(c) requires each respirator program to be administered by a suitably trained program administrator.

2) A preventive maintenance program should be established to ensure regularly scheduled preventative maintenance is conducted on each SCBA at least annually. It is noted that the District of Columbia Fire and Emergency Medical Services does not operate a preventive maintenance program but rather attempts to repair defective SCBA on an as-needed basis. It was reported that at one time the SCBA maintenance program consisted of an officer and eight fire fighters devoted to SCBA maintenance but that the program has dwindled to only one fire fighter, who is fully devoted to SCBA maintenance in a

department utilizing over 300 SCBA.

OSHA 1910.134(c)(1)(v); 1910.134(C)(1)(vi); and 1910.134(h) require the employer to develop and implement a written respiratory protection program that includes specific procedures and schedules for cleaning and disinfecting, storage, inspection, maintenance, and repair of respirators used by employees.

NFPA 1404, Chapter 6-1.2 and 6-1.3 require annual inspection and servicing of SCBA by qualified personnel. *Chapter 6-1.3* requires annual servicing to be conducted following the manufacturer's recommendations and should include :

- a) Disassembly of the SCBA into major components
- b) Flow testing of the regulator
- c) Disassembly and cleaning of the regulator
- d) Replacement of worn parts, or those recommended by the manufacturer in the regulator assembly.
- e) Disassembly of the low-air alarm and cleaning and replacement of component parts as necessary.
- f) Cleaning and replacement of components of the facepiece and harness assembly, and replacement of component parts as necessary.
- g) Reassembly of the entire SCBA and testing for proper operation of all components.
- h) Proper recording of all performed maintenance on record keeping forms.

NFPA 1404, Chapter 6-2.1 specifies that a preventative maintenance program shall be established by the authority having jurisdiction for all SCBA used in the organization.

NFPA 1404, Chapter 6-2.2 specifies that the SCBA preventative maintenance program shall be conducted in order to prevent SCBA malfunction and failures of equipment during use.

NFPA 1500, Chapter 5-3.1 specifies the fire department shall adopt and maintain a respiratory protection program that addresses the selection, inspection, safe use, and maintenance of respiratory protection equipment, training in its use, and the assurance of air quality testing.

3) Air quality analysis should be performed every 3 months and a certificate of compliance maintained at the filling station for all filling stations used to fill SCBA cylinders. During our visit, you verbally stated that this requirement was being complied with. However, evidence of an air quality test conducted within the past 3 months was not posted at the cylinder refilling station located at Station 4.